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Anima et al.

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(54) **CONTENT DISCOVERY IN A TOPICAL COMMUNITY**

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(73) Assignee: **Google Inc.**, Mountain View, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 628 days.

(21) Appl. No.: **13/743,263**

(22) Filed: **Jan. 16, 2013**

(51) **Int. Cl.**
G06F 17/00 (2006.01)
G06F 17/30 (2006.01)

(52) **U.S. Cl.**
CPC ***G06F 17/30283*** (2013.01)

(58) **Field of Classification Search**
CPC G06F 17/3053; G06F 17/30616; G06F 17/30663; G06F 17/30283
USPC 707/748, 738, 727, 999.002
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

7,827,052	B2 *	11/2010	Scott et al.	705/7.11
8,554,601	B1 *	10/2013	Marsh et al.	705/7.32
8,756,050	B1 *	6/2014	Harkness et al.	704/2
8,793,255	B1 *	7/2014	Bilinski et al.	707/740
2006/0080161	A1 *	4/2006	Arnett et al.	705/10
2007/0078675	A1 *	4/2007	Kaplan	705/1
2008/0082548	A1 *	4/2008	Betts	707/10
2008/0120376	A1 *	5/2008	Allsop	709/204
2009/0125382	A1 *	5/2009	Delepet	705/10
2009/0157490	A1 *	6/2009	Lawyer	705/11
2010/0131640	A1 *	5/2010	Carter	709/224
2010/0162093	A1 *	6/2010	Cierniak	715/205
2011/0231296	A1 *	9/2011	Gross et al.	705/37

(Continued)

OTHER PUBLICATIONS

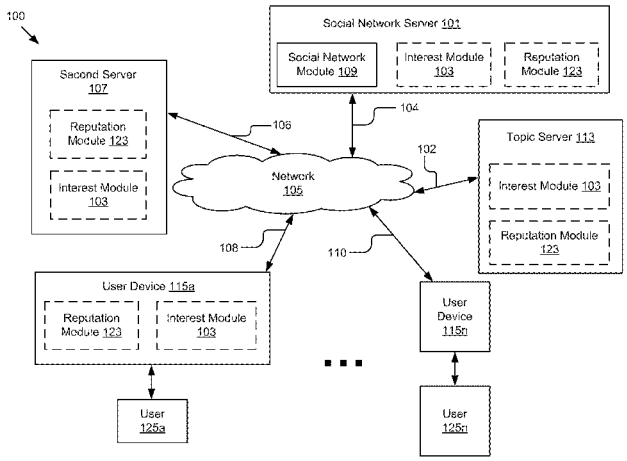
Wavii, http:wavii.com/about, Instant News Feeds, printed Jan. 15, 2013, 2 pages.

Primary Examiner — Mohammed R Uddin
(74) *Attorney, Agent, or Firm* — Patent Law Works LLP

(57) **ABSTRACT**

The disclosure includes a system and method for discovering content in a topical community. The system includes a processor and a memory storing instructions when executed cause the system to: receive data indicating a first engagement action associated with a content item, the first engagement action performed by a first user; determine a topic associated with the content item; determine a topical reputation score related to the topic for the first user based on one or more second engagement actions performed by one or more second users associated with the content item; determine that the topical reputation score satisfies a reputation threshold; unlock the topic for the first user responsive to the determination that the topical reputation score satisfies the reputation threshold and provide the first user an ability to curate other content items associated with the unlocked topic.

20 Claims, 34 Drawing Sheets

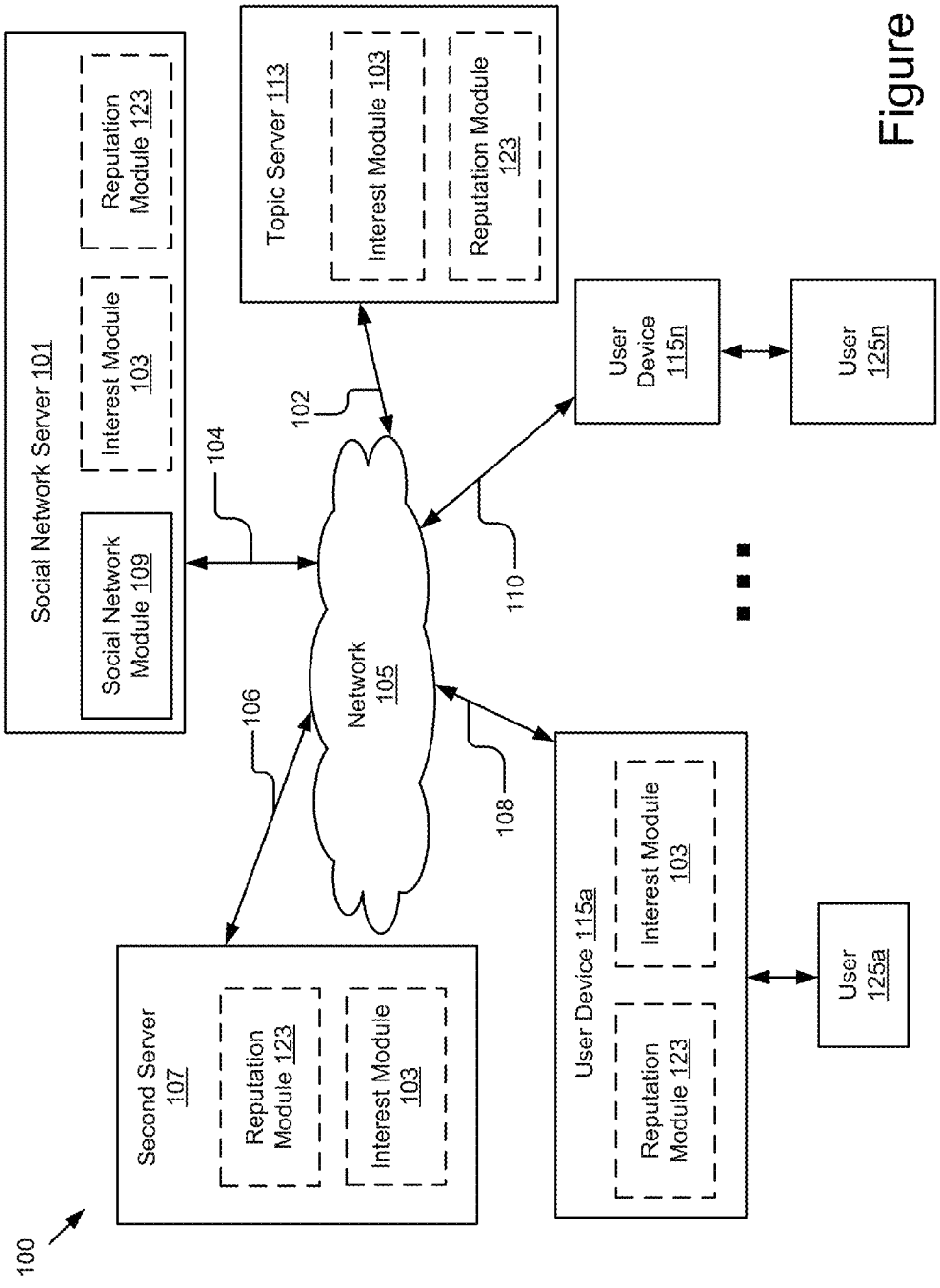


(56) **References Cited**

U.S. PATENT DOCUMENTS

2011/0313988	A1*	12/2011	Ghosh et al.	707/706
2012/0005224	A1*	1/2012	Ahrens et al.	707/769
2012/0215773	A1*	8/2012	Si et al.	707/723
2012/0246230	A1*	9/2012	Ferbar et al.	709/204
2012/0296920	A1*	11/2012	Sahni et al.	707/749
2013/0018957	A1*	1/2013	Parnaby et al.	709/204
2013/0179511	A1*	7/2013	Stevens et al.	709/204
2015/0135058	A1*	5/2015	Metcalf et al.	715/234

* cited by examiner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Social Network Server 101
Social Network Module 109
Interest Module 103
Reputation Module 123
Topic Server 113
Interest Module 103
Reputation Module 123
Second Server 107
Reputation Module 123
Interest Module 103
User Device 115a
Reputation Module 123
Interest Module 103
User 125a
User Device 115n
User 125n
Network 105
102
104
106
108
110

Figure 1

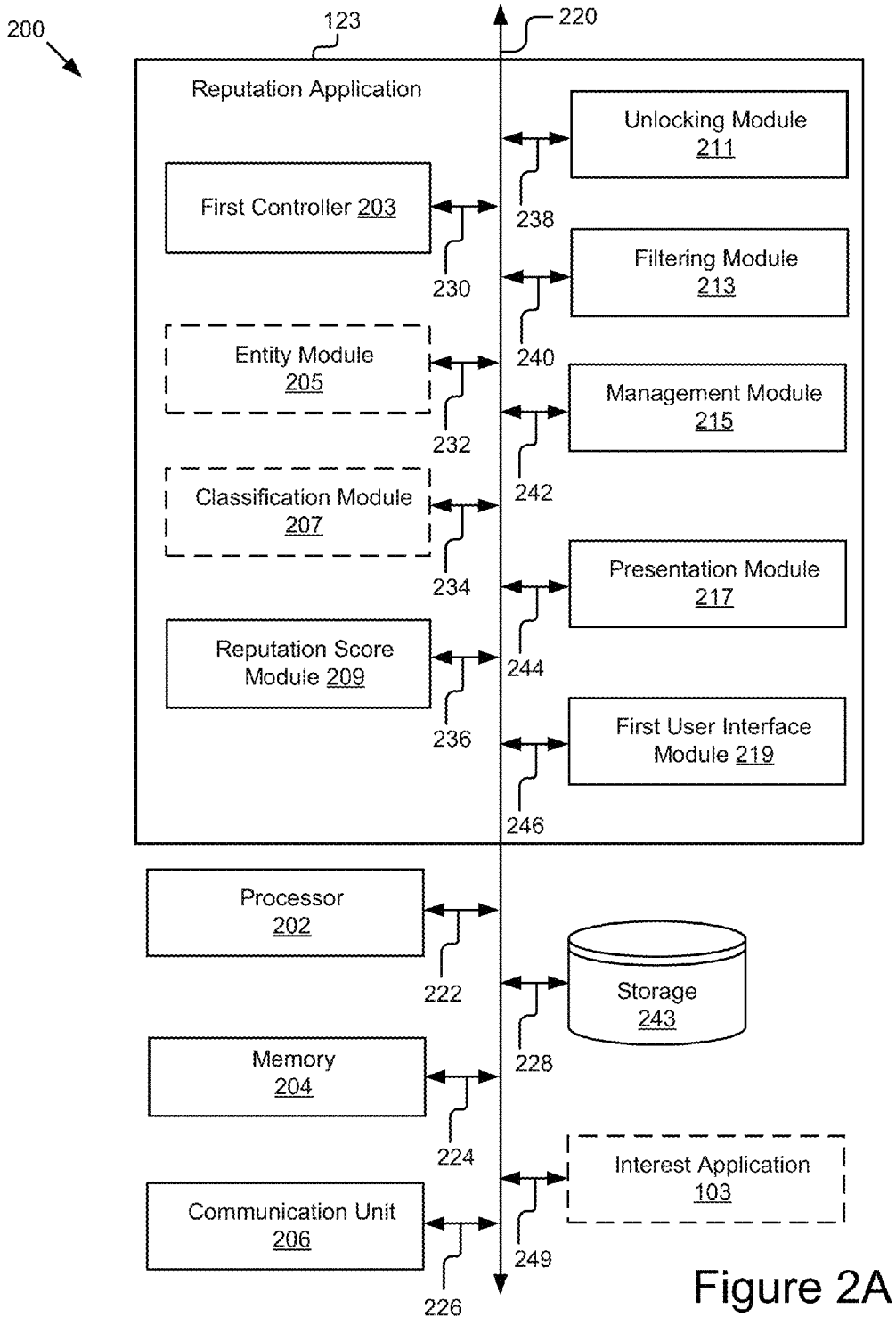

200
123
220
Reputation Application
Unlocking Module 211
First Controller 203
238
230
Filtering Module 213
240
Entity Module 205
232
Management Module 215
242
Classification Module 207
234
Presentation Module 217
244
Reputation Score Module 209
236
First User Interface Module 219
246
Processor 202
222
Storage 243
228
Memory 204
224
Interest Application 103
Communication Unit 206
249
226

Figure 2A

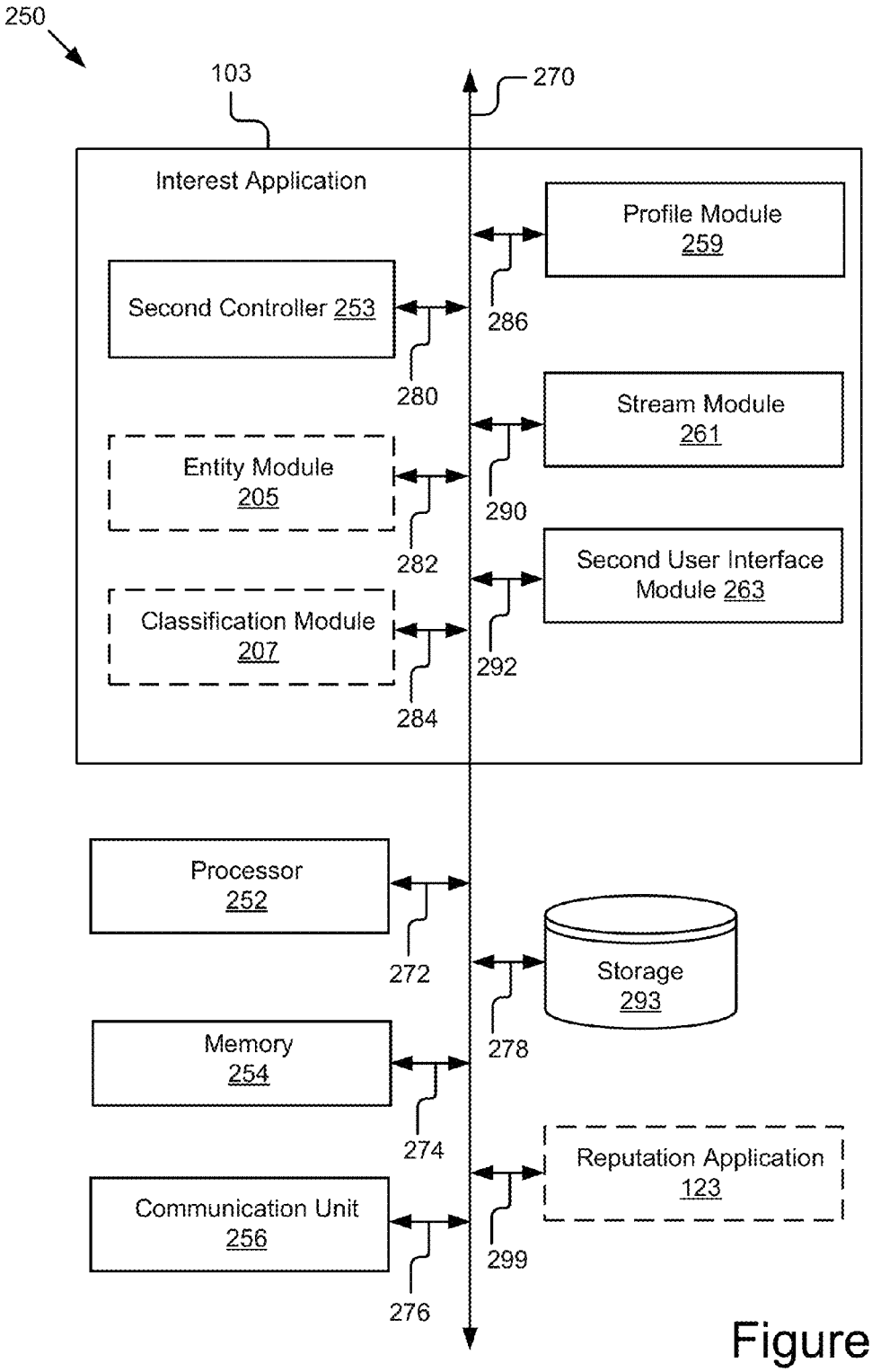

250
103
270
Interest Application
Profile Module
259
Second Controller 253
286
280
Stream Module
261
Entity Module
205
290
282
Second User Interface
Module 263
Classification Module
207
292
284
Processor
252
272
Storage
293
278
Memory
254
274
Reputation Application
123
Communication Unit
256
299
276

Figure 2B

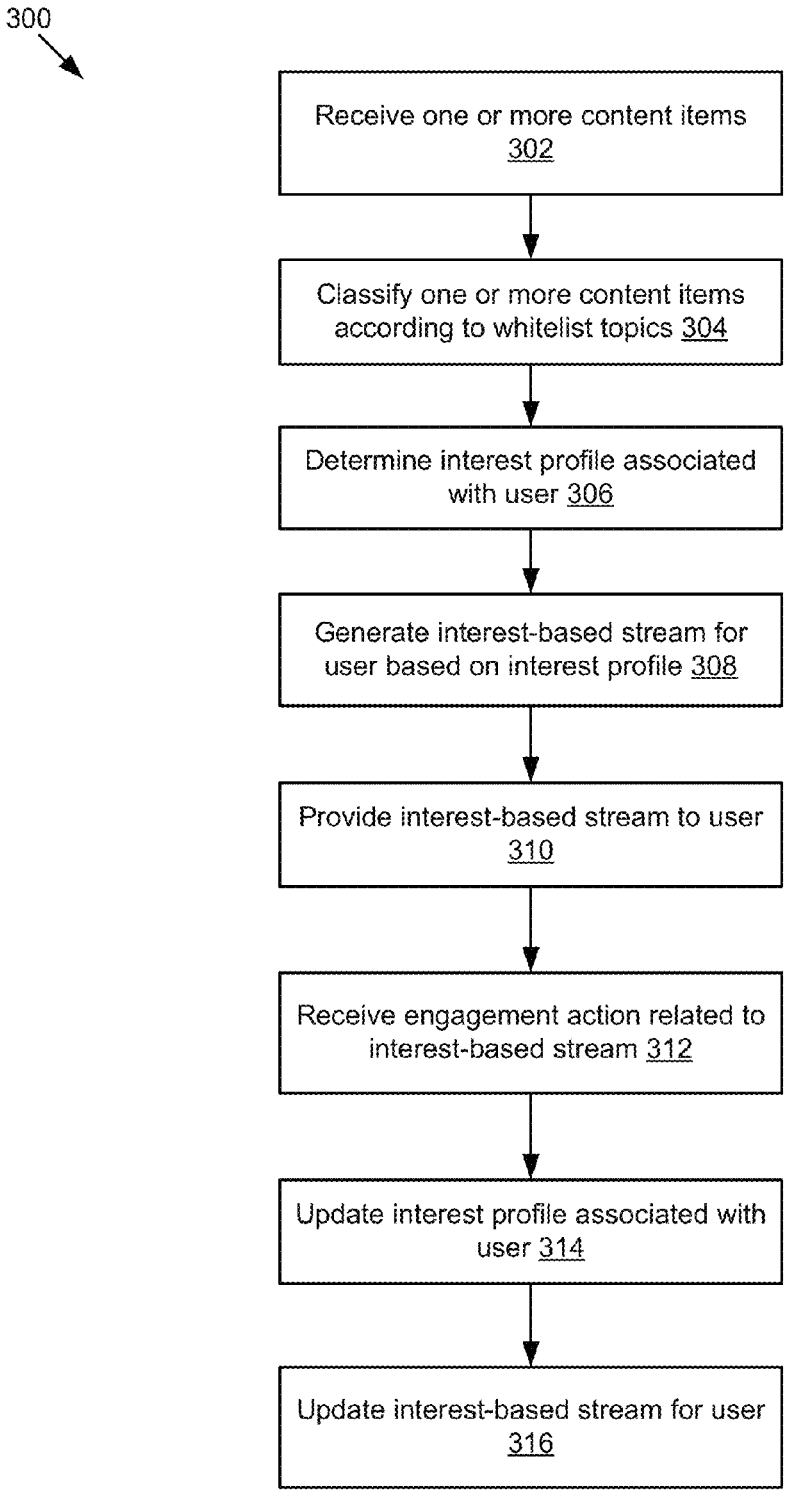

300
Receive one or more content items 302
Classify one or more content items according to whitelist topics 304
Determine interest profile associated with user 306
Generate interest-based stream for user based on interest profile 308
Provide interest-based stream to user 310
Receive engagement action related to interest-based stream 312
Update interest profile associated with user 314
Update interest-based stream for user 316

Figure 3

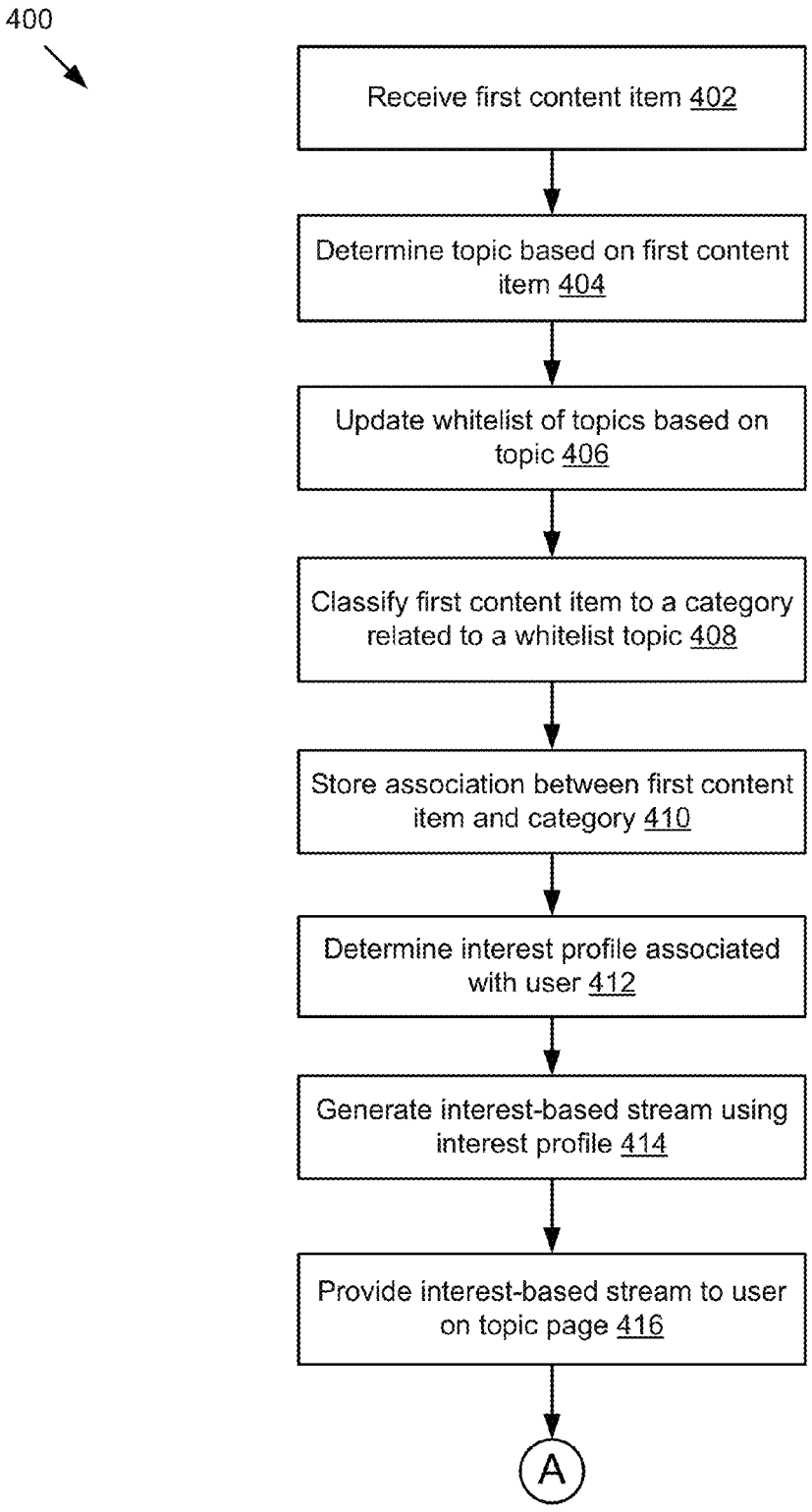

400
Receive first content item 402
Determine topic based on first content item 404
Update whitelist of topics based on topic 406
Classify first content item to a category related to a whitelist topic 408
Store association between first content item and category 410
Determine interest profile associated with user 412
Generate interest-based stream using interest profile 414
Provide interest-based stream to user on topic page 416
A

Figure 4A

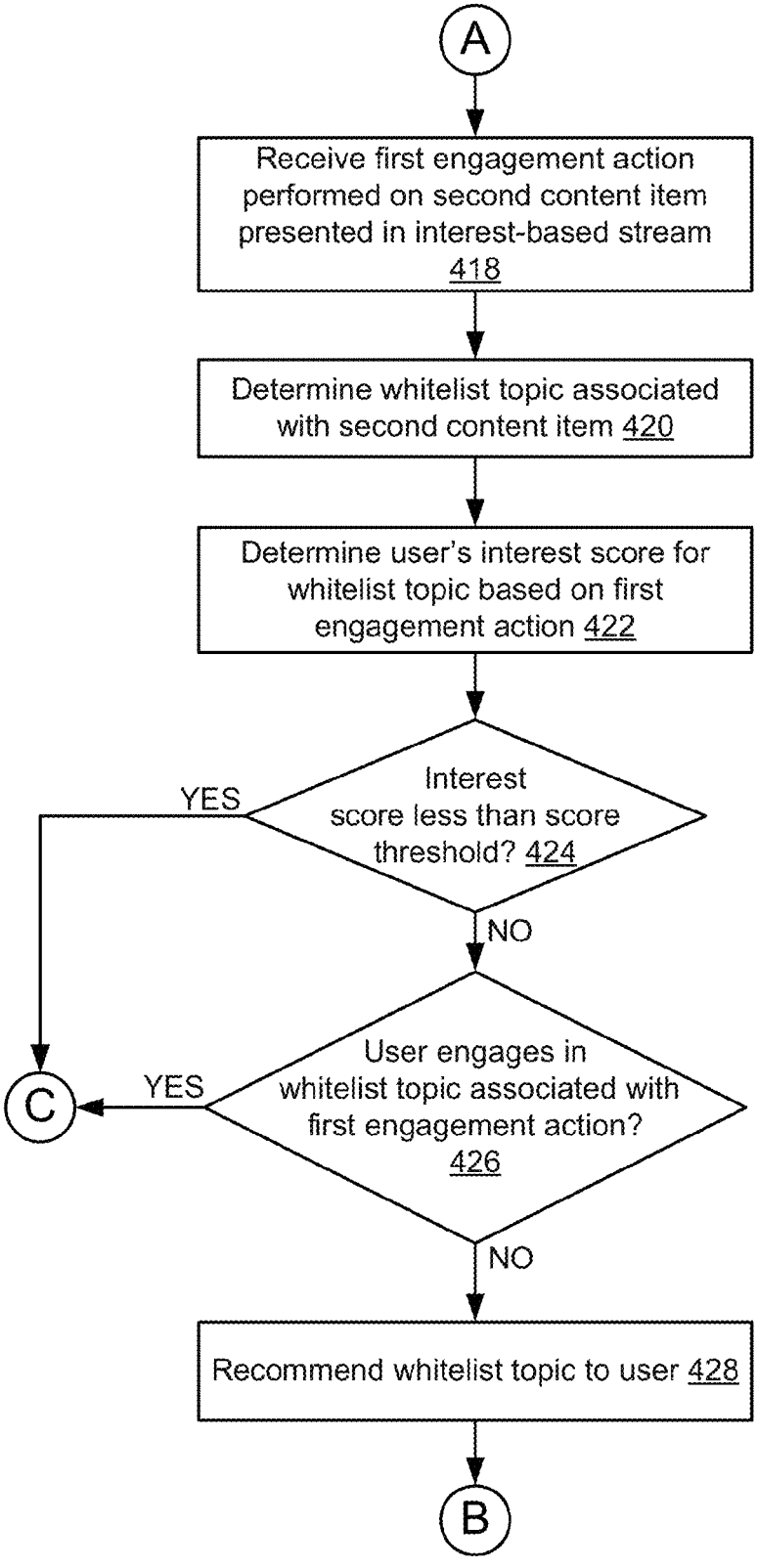

A
Receive first engagement action performed on second content item presented in interest-based stream 418
Determine whitelist topic associated with second content item 420
Determine user's interest score for whitelist topic based on first engagement action 422
Interest score less than score threshold? 424
YES
NO
User engages in whitelist topic associated with first engagement action? 426
YES
C
NO
Recommend whitelist topic to user 428
B

Figure 4B

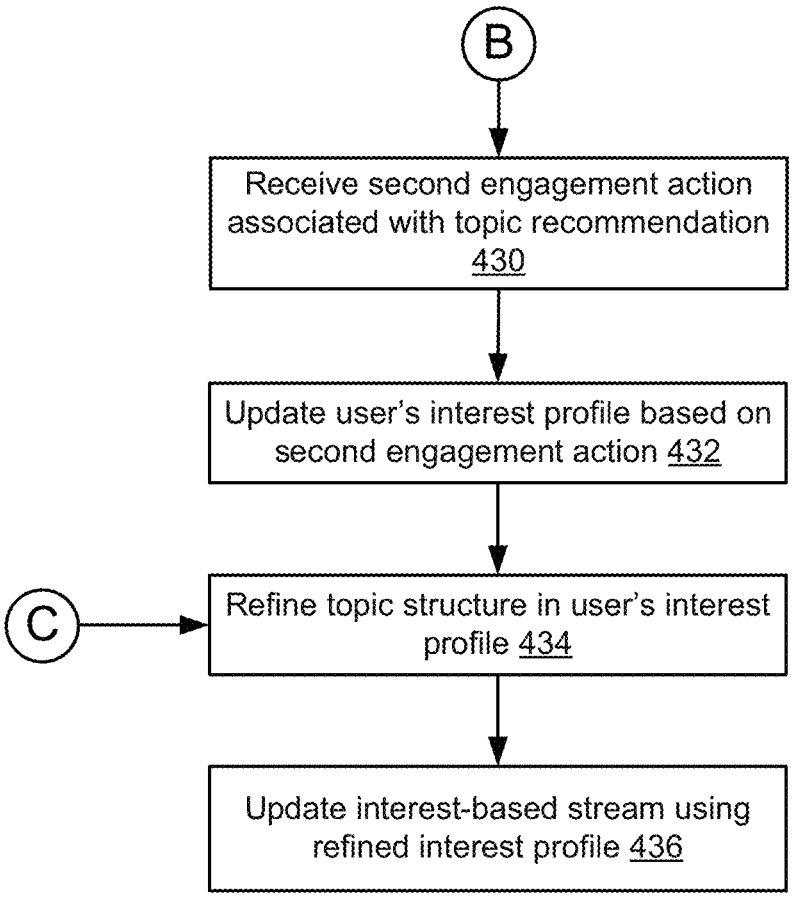

B
Receive second engagement action associated with topic recommendation 430
Update user's interest profile based on second engagement action 432
C
Refine topic structure in user's interest profile 434
Update interest-based stream using refined interest profile 436

Figure 4C

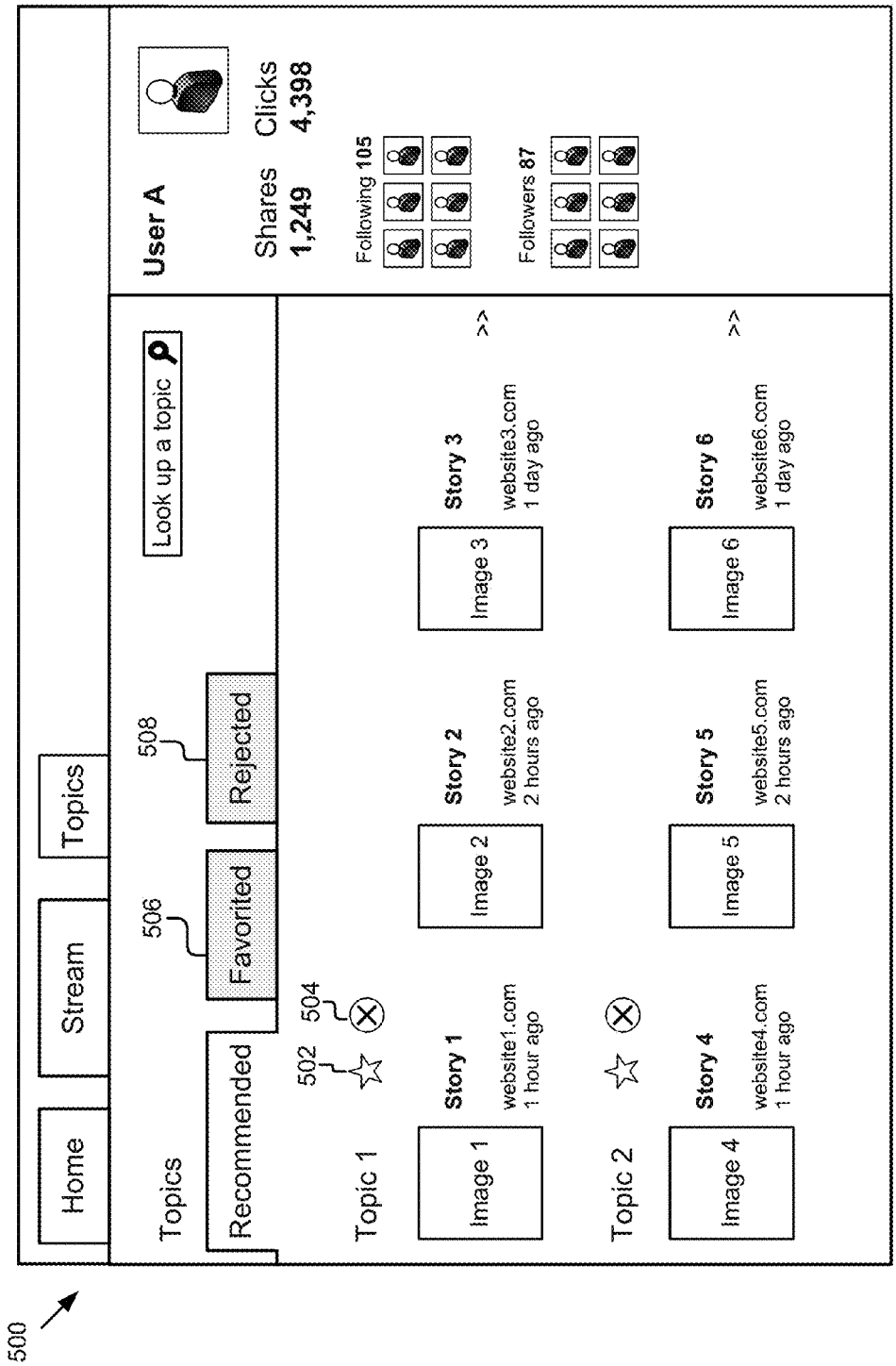

500
Home
Stream
Topics
Topics
Recommended
506
Favorited
508
Rejected
Look up a topic
User A
Shares 1,249
Clicks 4,398
Following 105
Followers 87
Topic 1
502
504
Image 1
Story 1
website1.com
1 hour ago
Image 2
Story 2
website2.com
2 hours ago
Image 3
Story 3
website3.com
1 day ago
>>
Topic 2
Image 4
Story 4
website4.com
1 hour ago
Image 5
Story 5
website5.com
2 hours ago
Image 6
Story 6
website6.com
1 day ago
>>

Figure 5A

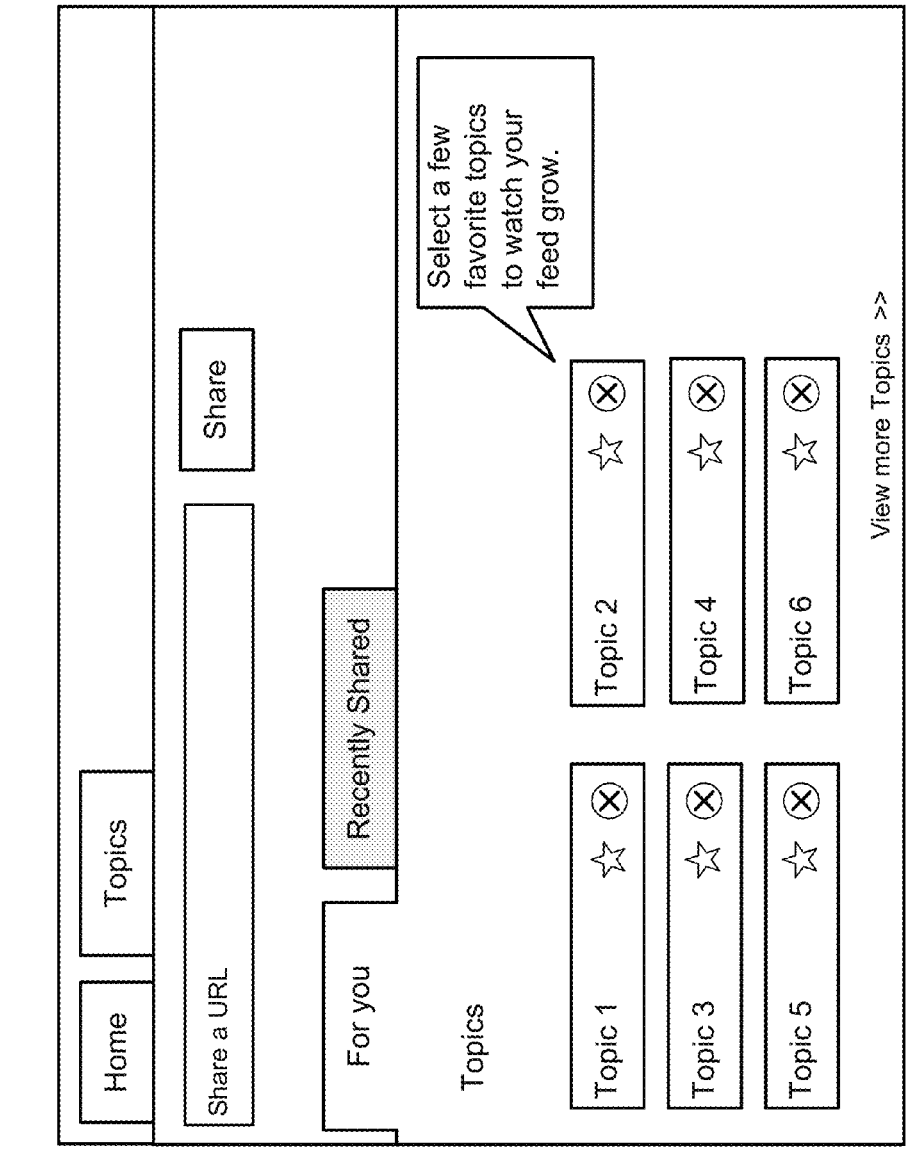

520
Home
Topics
Share a URL
Share
For you
Recently Shared
Topics
Select a few favorite topics to watch your feed grow.
Topic 1
Topic 2
Topic 3
Topic 4
Topic 5
Topic 6
View more Topics >>

Figure 5B

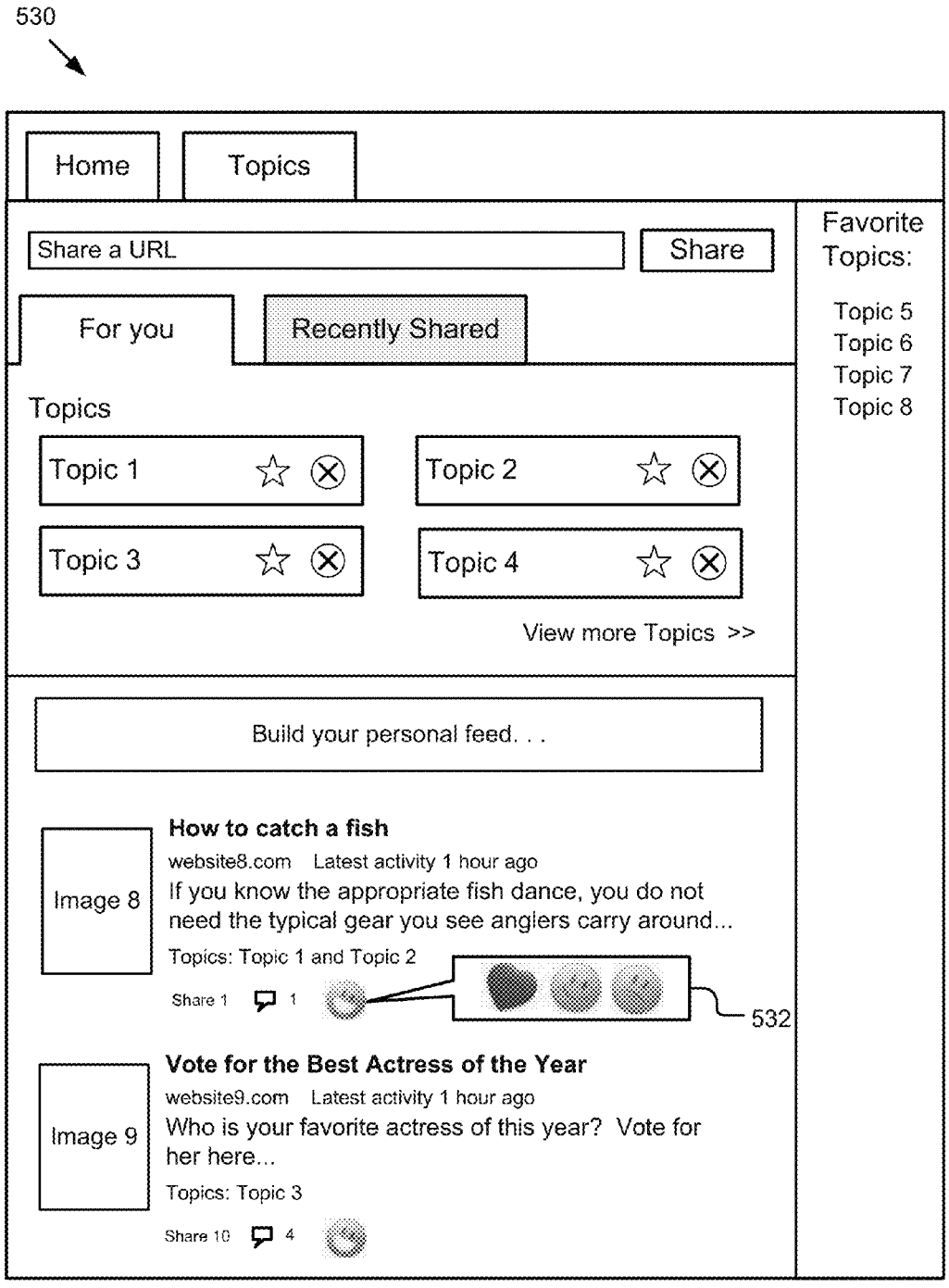

530
Home
Topics
Share a URL
Share
For you
Recently Shared
Topics
Topic 1
Topic 2
Topic 3
Topic 4
View more Topics >>
Favorite Topics:
Topic 5
Topic 6
Topic 7
Topic 8
Build your personal feed. . .
Image 8
How to catch a fish
website8.com Latest activity 1 hour ago
If you know the appropriate fish dance, you do not need the typical gear you see anglers carry around...
Topics: Topic 1 and Topic 2
Share 1
1
532
Image 9
Vote for the Best Actress of the Year
website9.com Latest activity 1 hour ago
Who is your favorite actress of this year? Vote for her here...
Topics: Topic 3
Share 10
4

Figure 5C

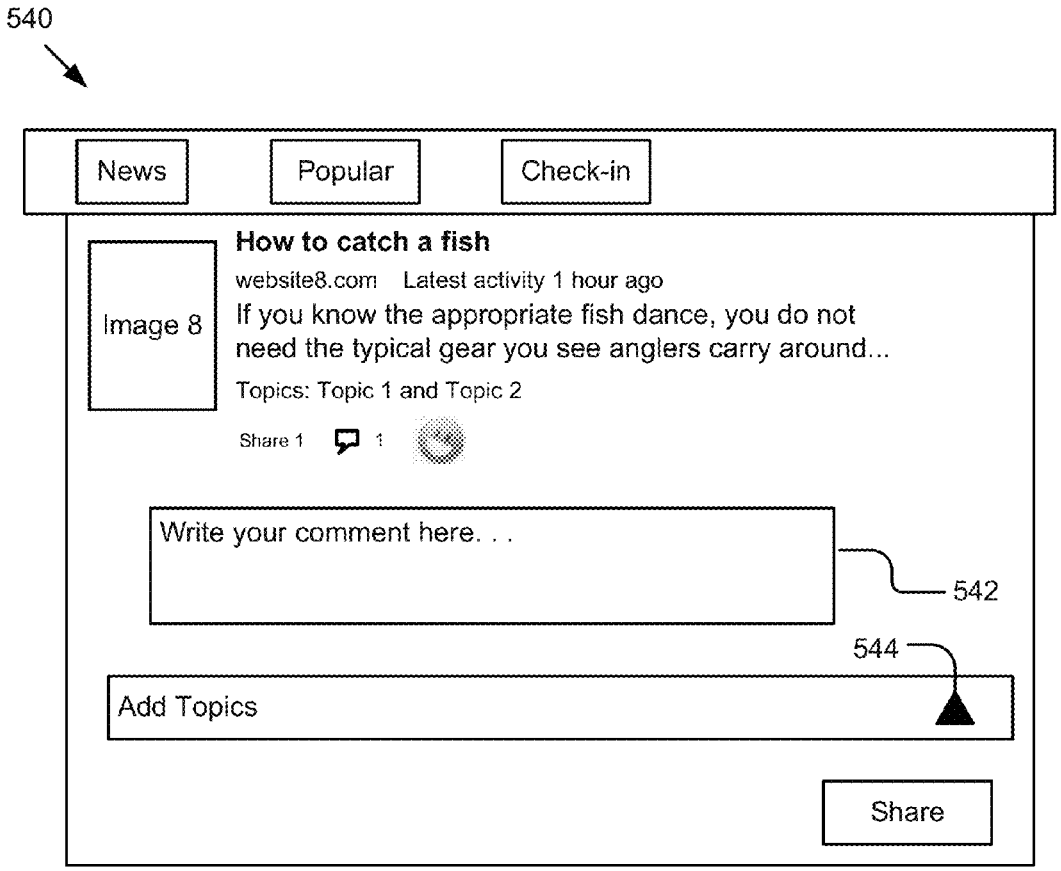

540
News
Popular
Check-in
Image 8
How to catch a fish
website8.com Latest activity 1 hour ago
If you know the appropriate fish dance, you do not need the typical gear you see anglers carry around...
Topics: Topic 1 and Topic 2
Share 1
1
Write your comment here. . .
542
544
Add Topics
Share

Figure 5D

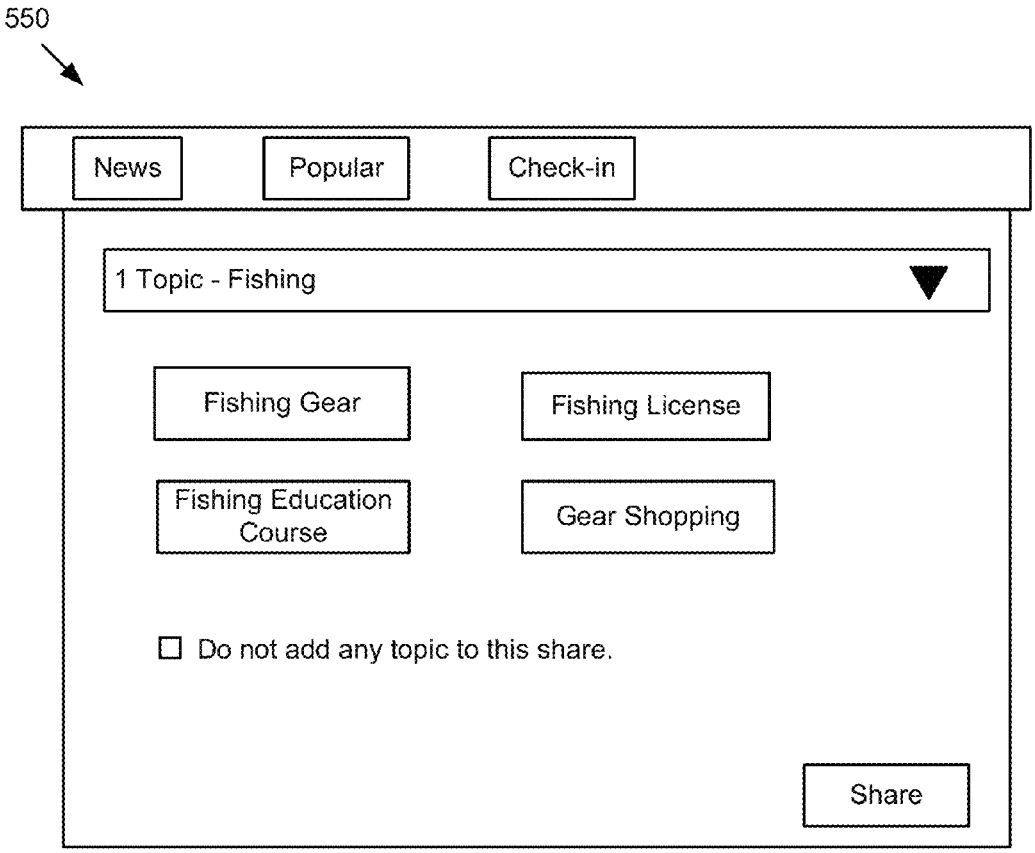

550
News
Popular
Check-in
1 Topic - Fishing
Fishing Gear
Fishing License
Fishing Education Course
Gear Shopping
Do not add any topic to this share.
Share

Figure 5E

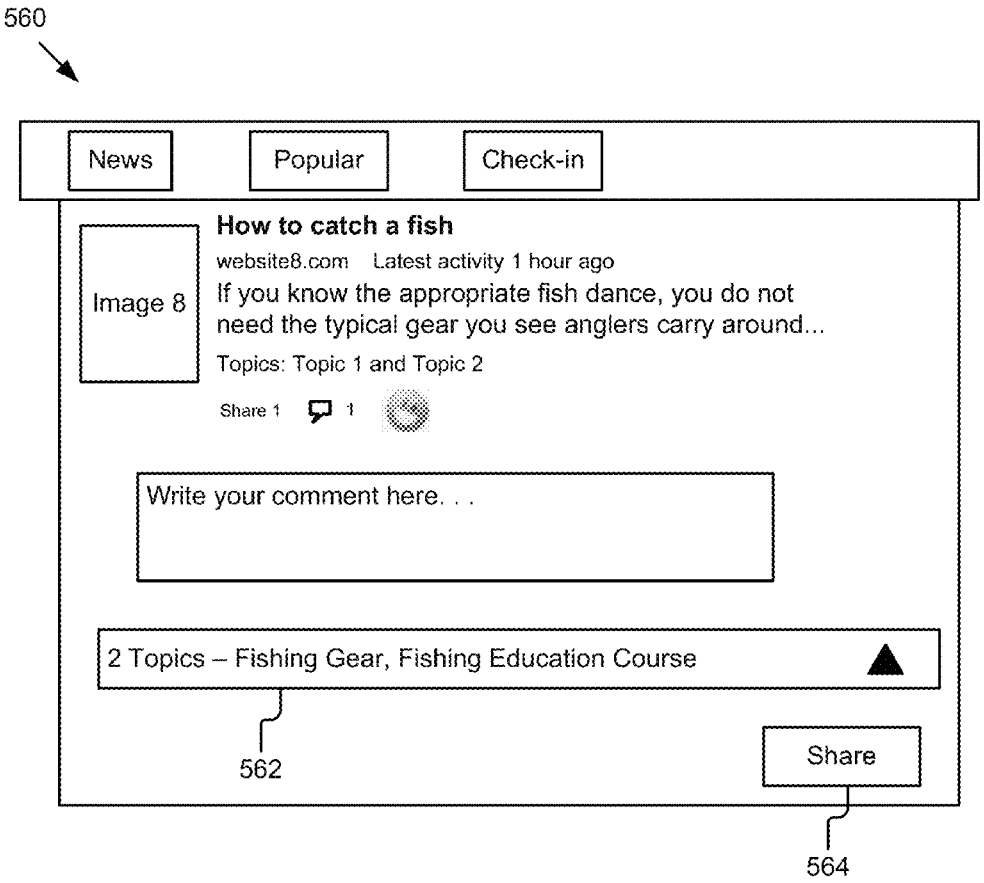

560
News
Popular
Check-in
Image 8
How to catch a fish
website8.com Latest activity 1 hour ago
If you know the appropriate fish dance, you do not need the typical gear you see anglers carry around...
Topics: Topic 1 and Topic 2
Share 1
1
Write your comment here. . .
2 Topics – Fishing Gear, Fishing Education Course
562
Share
564

Figure 5F

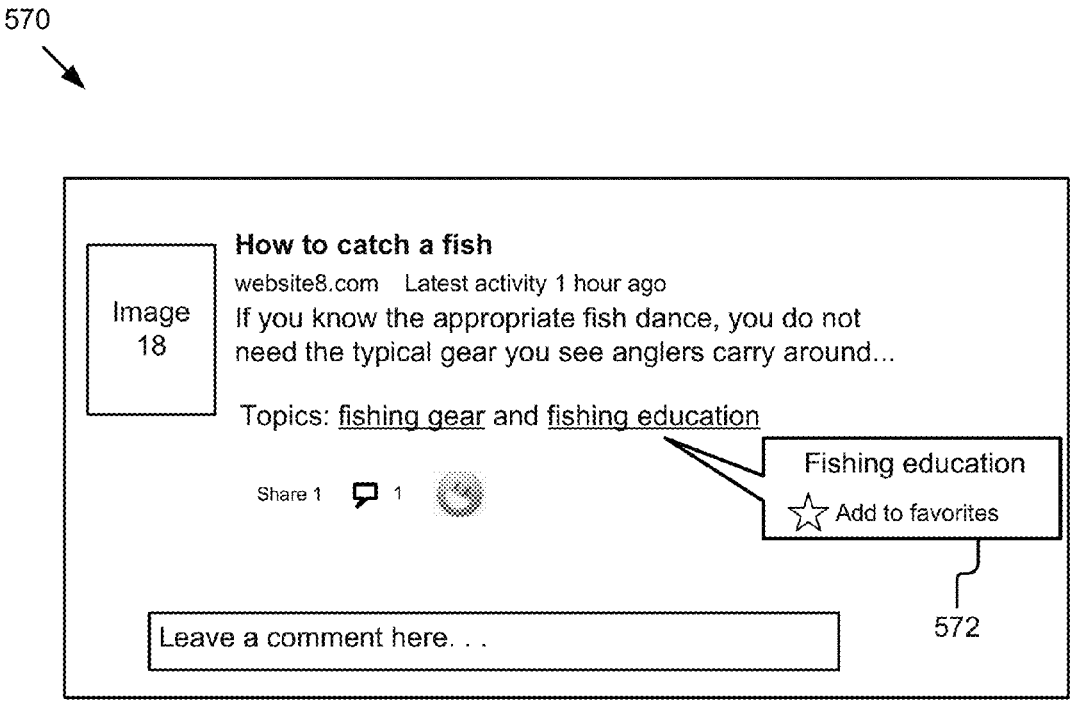

570
Image 18
How to catch a fish
website8.com Latest activity 1 hour ago
If you know the appropriate fish dance, you do not need the typical gear you see anglers carry around...
Topics: fishing gear and fishing education
Share 1
1
Fishing education
Add to favorites
572
Leave a comment here. . .

Figure 5G

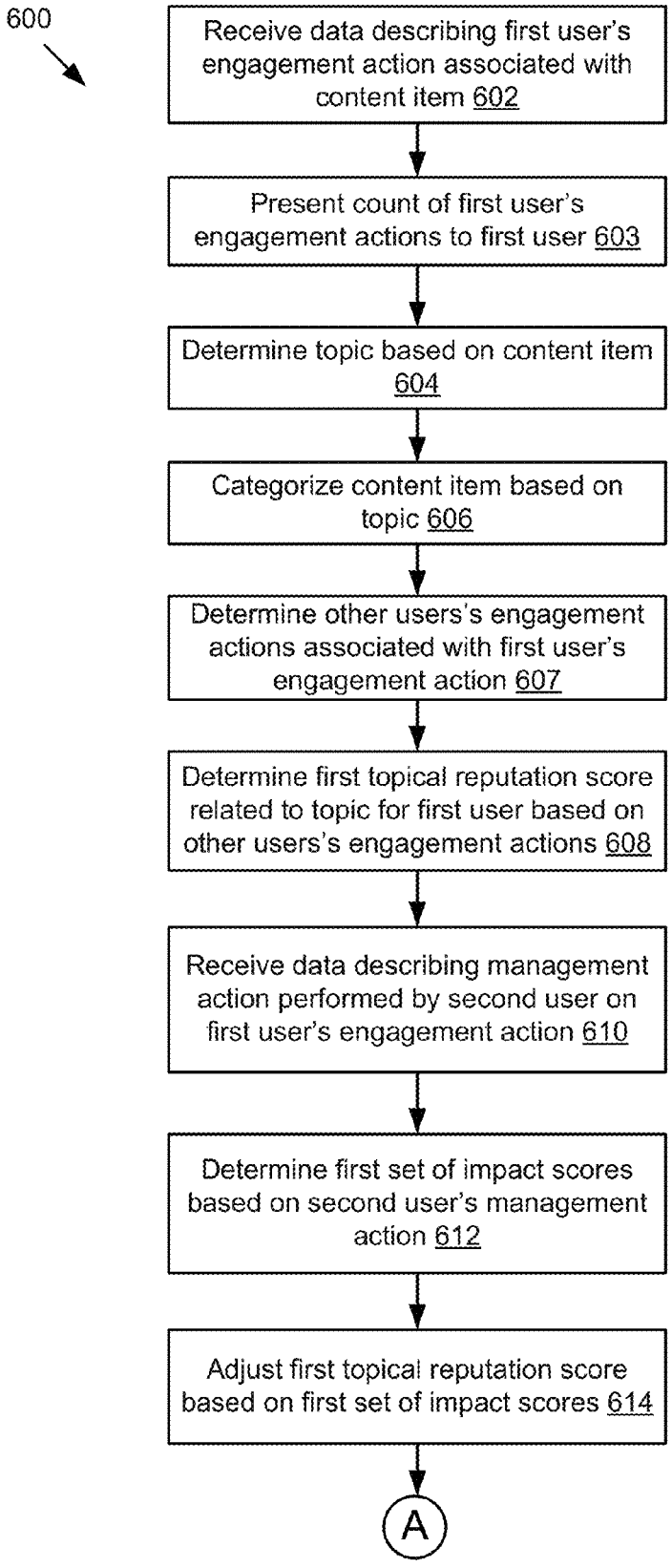

600
Receive data describing first user's engagement action associated with content item 602
Present count of first user's engagement actions to first user 603
Determine topic based on content item 604
Categorize content item based on topic 606
Determine other users's engagement actions associated with first user's engagement action 607
Determine first topical reputation score related to topic for first user based on other users's engagement actions 608
Receive data describing management action performed by second user on first user's engagement action 610
Determine first set of impact scores based on second user's management action 612
Adjust first topical reputation score based on first set of impact scores 614
A

Figure 6A

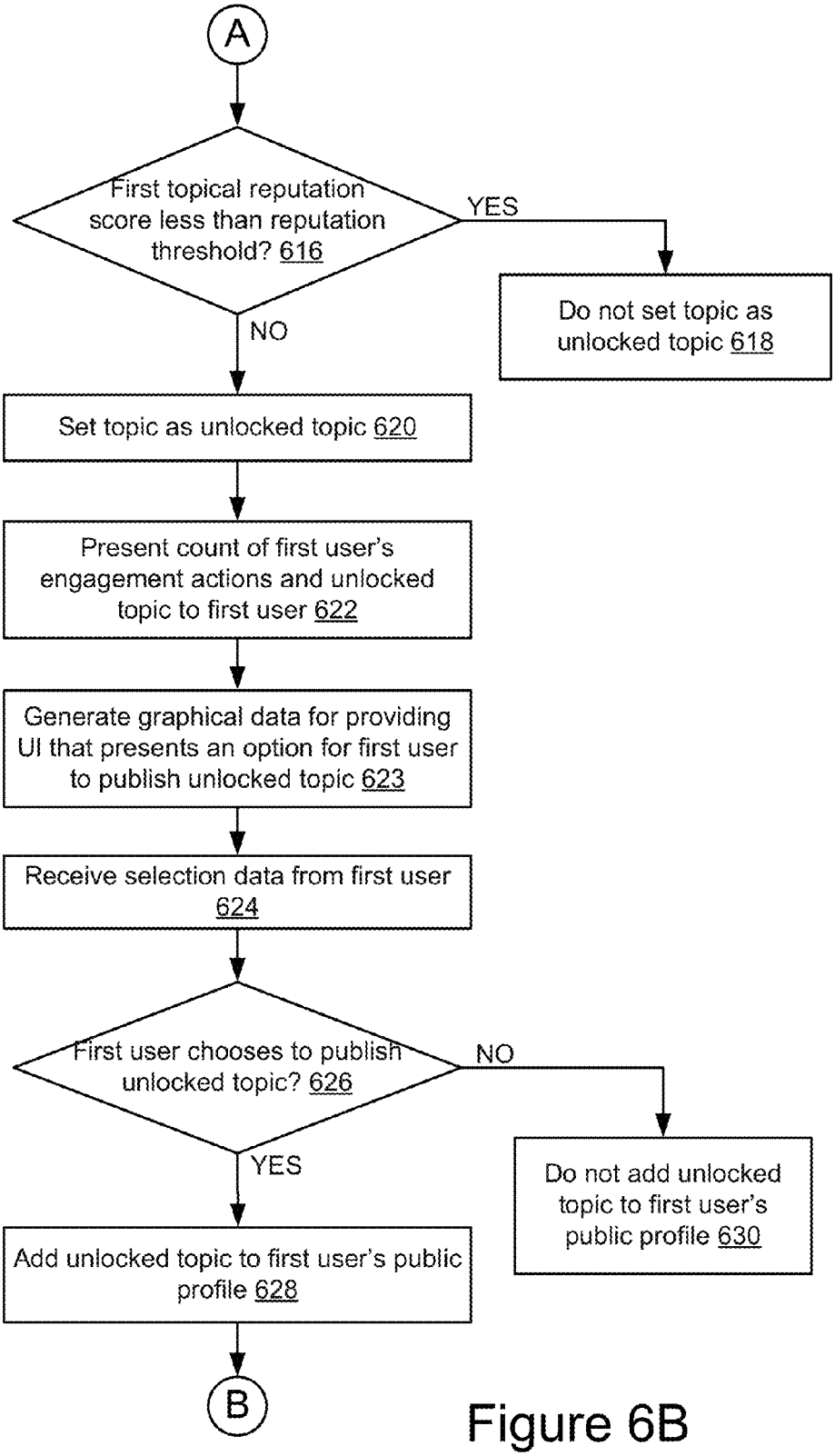

A
First topical reputation score less than reputation threshold? 616
YES
Do not set topic as unlocked topic 618
NO
Set topic as unlocked topic 620
Present count of first user's engagement actions and unlocked topic to first user 622
Generate graphical data for providing UI that presents an option for first user to publish unlocked topic 623
Receive selection data from first user 624
First user chooses to publish unlocked topic? 626
NO
Do not add unlocked topic to first user's public profile 630
YES
Add unlocked topic to first user's public profile 628
B

Figure 6B

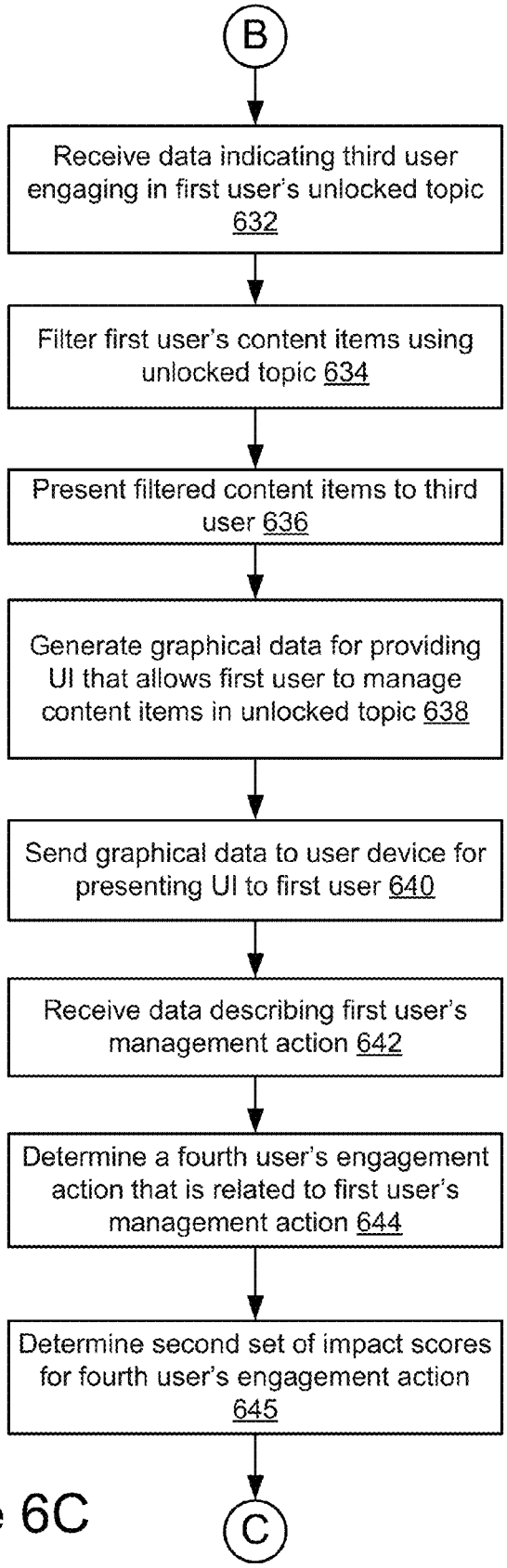

B
Receive data indicating third user engaging in first user's unlocked topic 632
Filter first user's content items using unlocked topic 634
Present filtered content items to third user 636
Generate graphical data for providing UI that allows first user to manage content items in unlocked topic 638
Send graphical data to user device for presenting UI to first user 640
Receive data describing first user's management action 642
Determine a fourth user's engagement action that is related to first user's management action 644
Determine second set of impact scores for fourth user's engagement action 645
C

Figure 6C

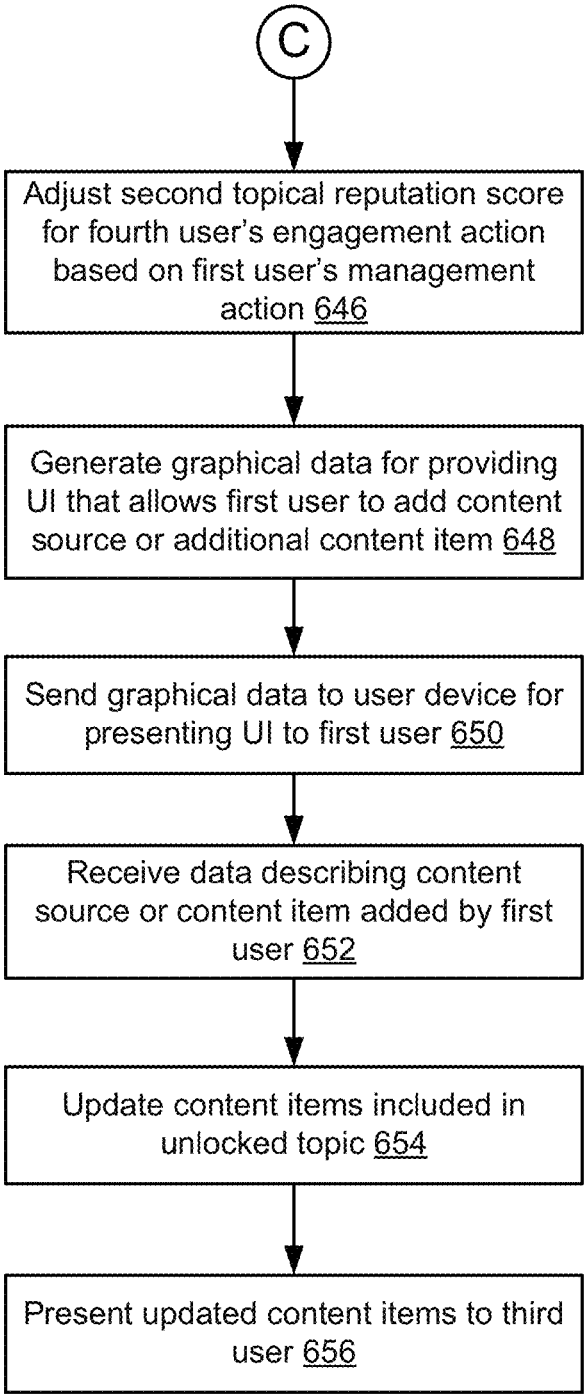

C
Adjust second topical reputation score for fourth user's engagement action based on first user's management action 646
Generate graphical data for providing UI that allows first user to add content source or additional content item 648
Send graphical data to user device for presenting UI to first user 650
Receive data describing content source or content item added by first user 652
Update content items included in unlocked topic 654
Present updated content items to third user 656

Figure 6D

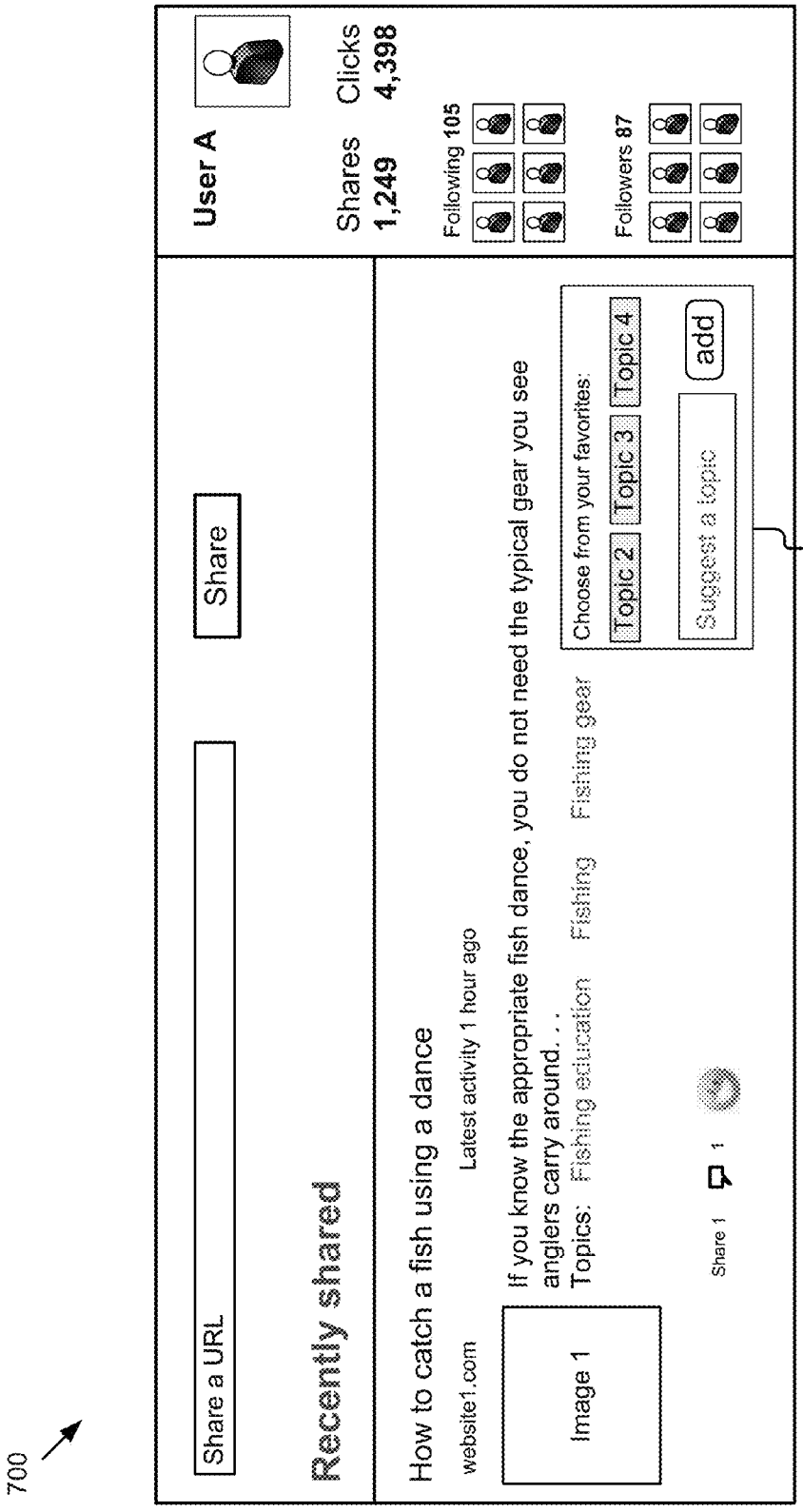

700
Share a URL
Share
User A
Shares 1,249
Clicks 4,398
Following 105
Followers 87
Recently shared
How to catch a fish using a dance
website1.com
Latest activity 1 hour ago
If you know the appropriate fish dance, you do not need the typical gear you see anglers carry around. . .
Topics: Fishing education Fishing Fishing gear
Image 1
Share 1
1
Choose from your favorites:
Topic 2
Topic 3
Topic 4
Suggest a topic
add
702

Figure 7

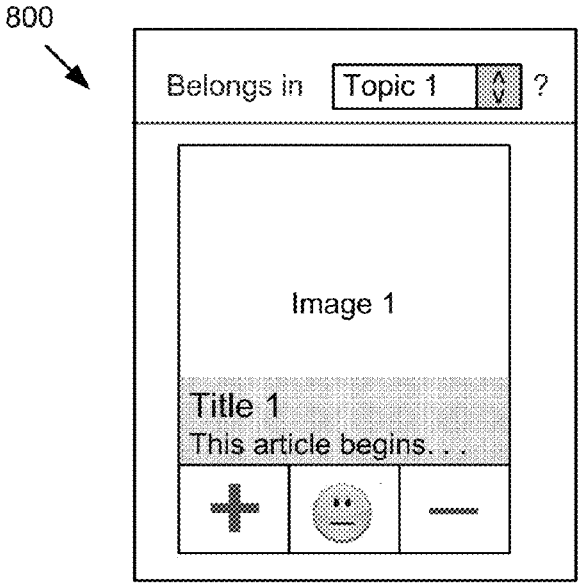


Figure 8A

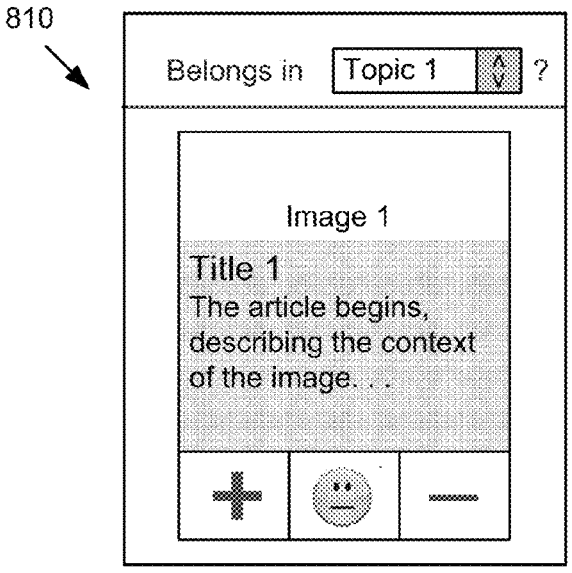


Figure 8B

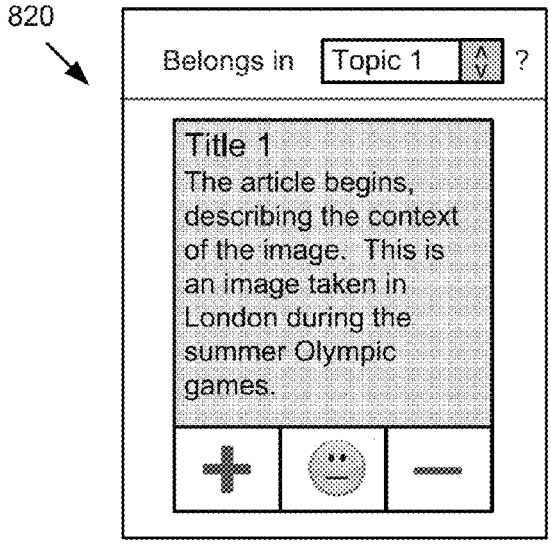
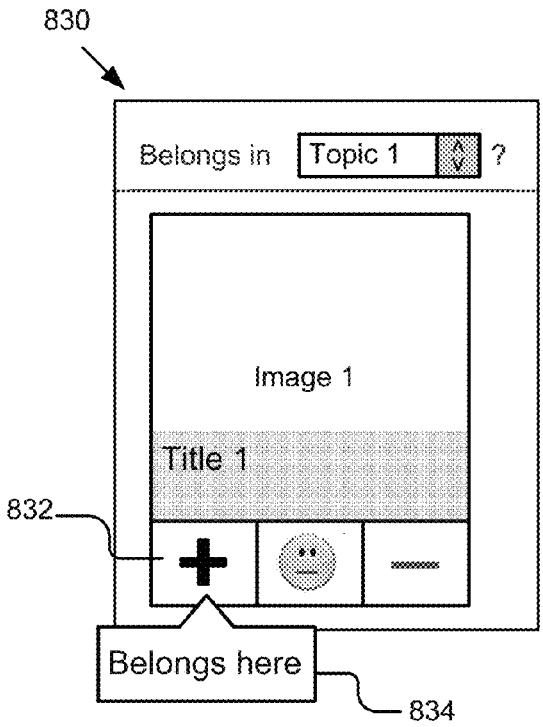


Figure 8C



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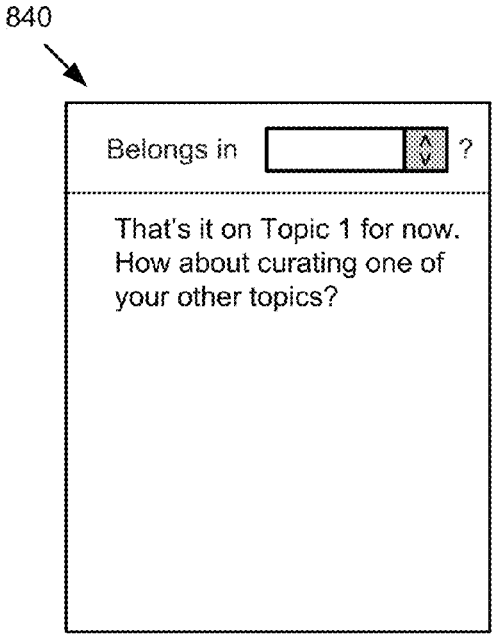

Figure 8E

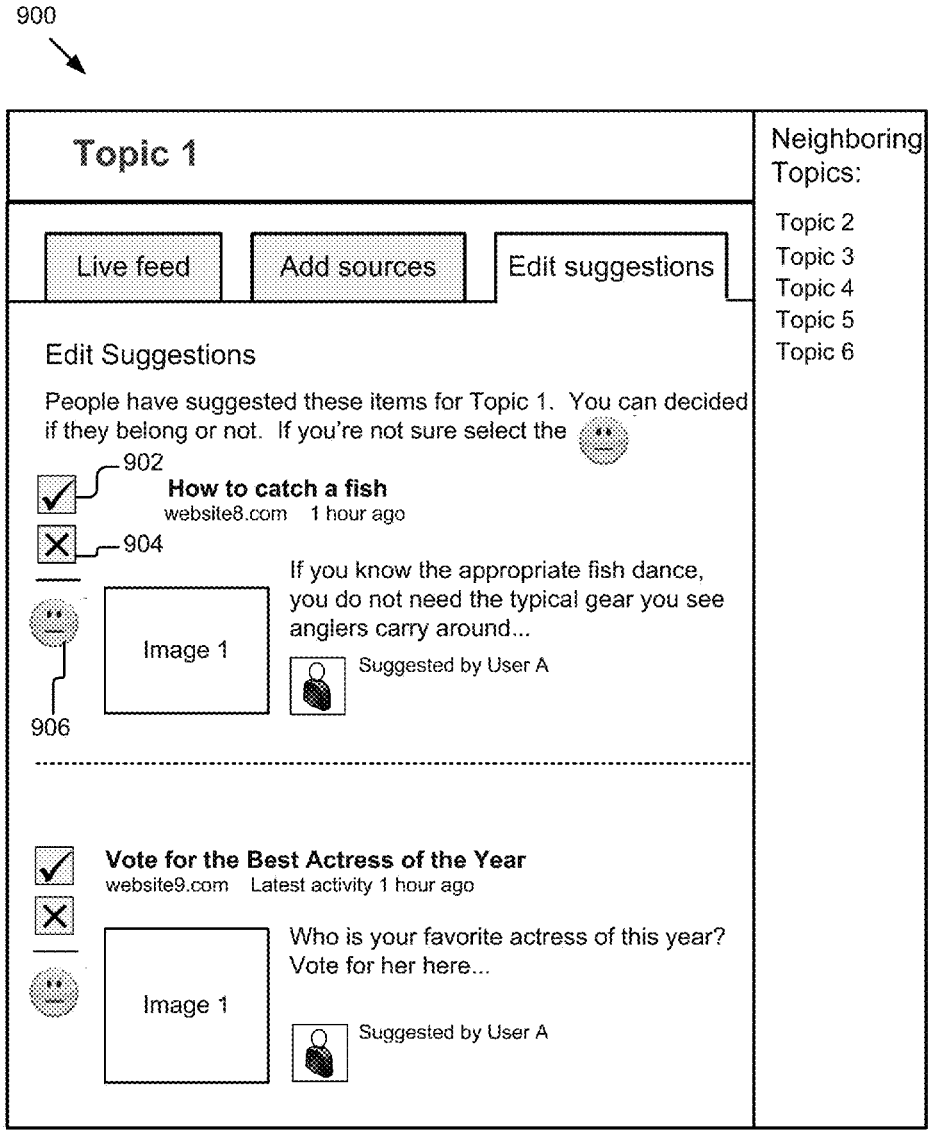
900
Topic 1
Neighboring Topics:
Topic 2
Topic 3
Topic 4
Topic 5
Topic 6
Live feed
Add sources
Edit suggestions
Edit Suggestions
People have suggested these items for Topic 1. You can decided if they belong or not. If you're not sure select the
902
How to catch a fish
website8.com 1 hour ago
904
If you know the appropriate fish dance, you do not need the typical gear you see anglers carry around...
Image 1
Suggested by User A
906
Vote for the Best Actress of the Year
website9.com Latest activity 1 hour ago
Who is your favorite actress of this year? Vote for her here...
Image 1
Suggested by User A

Figure 9

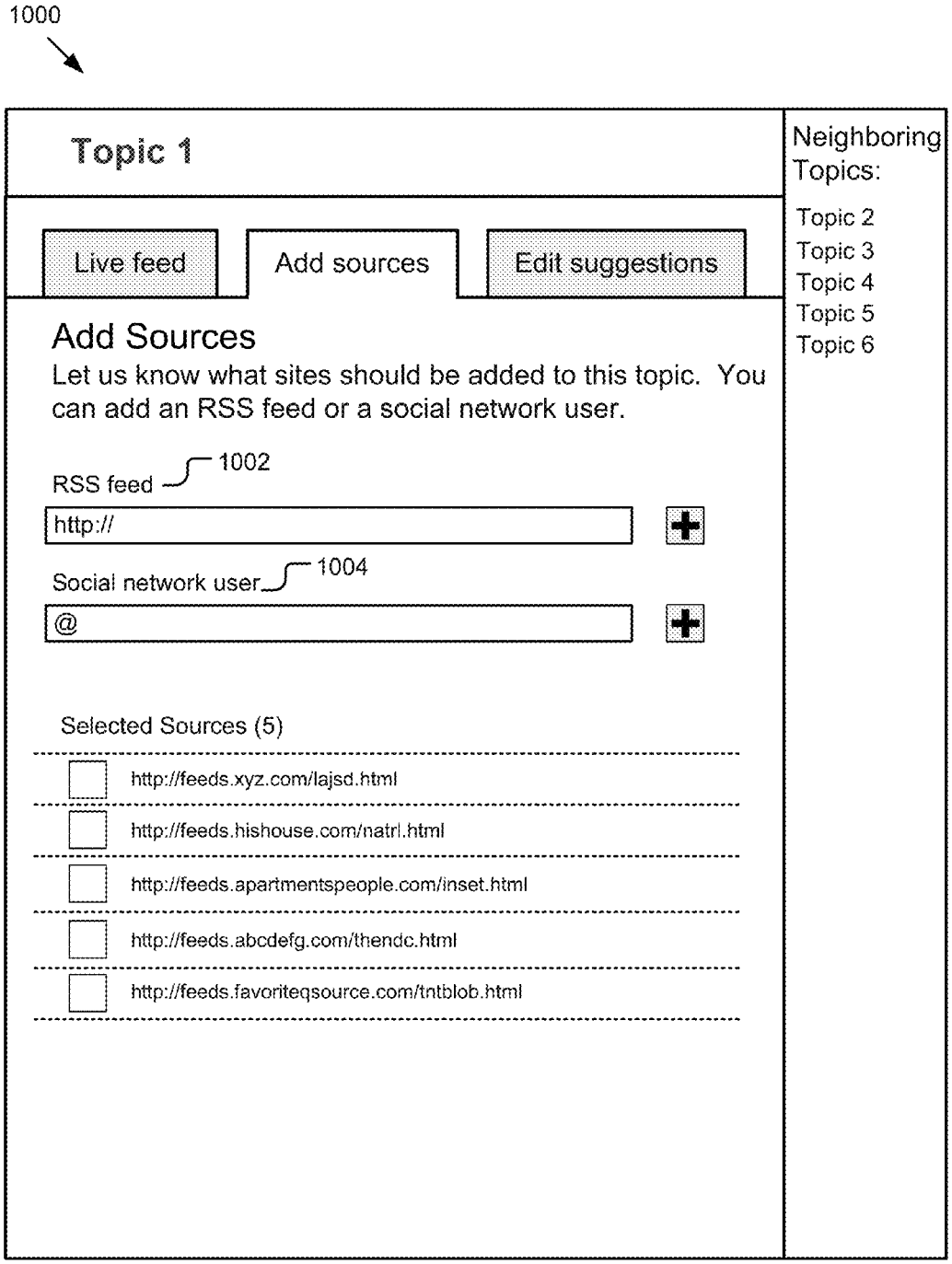
1000
Topic 1
Neighboring Topics:
Topic 2
Topic 3
Topic 4
Topic 5
Topic 6
Live feed
Add sources
Edit suggestions
Add Sources
Let us know what sites should be added to this topic. You can add an RSS feed or a social network user.
RSS feed
1002
http://
Social network user
1004
@
Selected Sources (5)
http://feeds.xyz.com/lajsd.html
http://feeds.hishouse.com/natrl.html
http://feeds.apartmentspeople.com/inset.html
http://feeds.abcdefg.com/thendc.html
http://feeds.favoriteqsource.com/tntblob.html

Figure 10

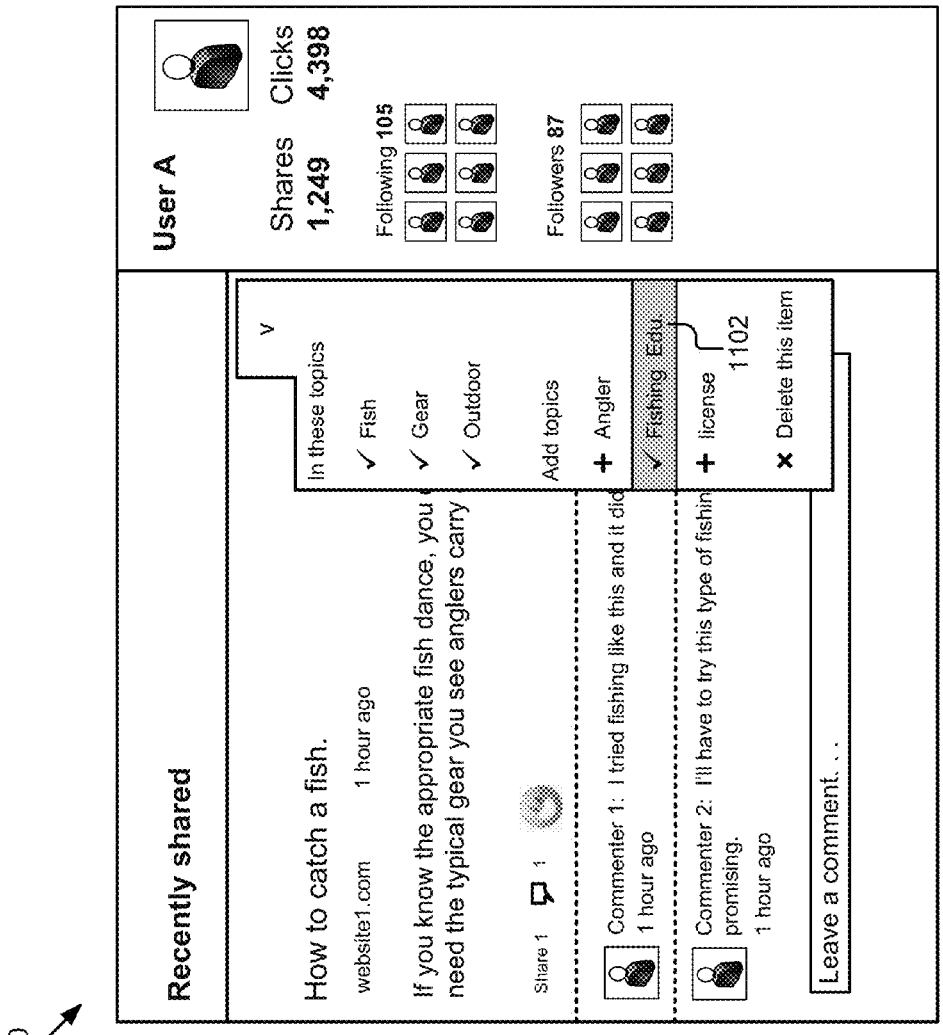
1100
Recently shared
User A
Shares 1,249
Clicks 4,398
Following 105
Followers 87
How to catch a fish.
website1.com 1 hour ago
If you know the appropriate fish dance, you need the typical gear you see anglers carry
Share 1
In these topics
✓ Fish
✓ Gear
✓ Outdoor
Add topics
+ Angler
✓ Fishing Edu
+ license
1102
× Delete this item
Commenter 1: I tried fishing like this and it did
1 hour ago
Commenter 2: I'll have to try this type of fishin
promising.
1 hour ago
Leave a comment. . .

Figure 11

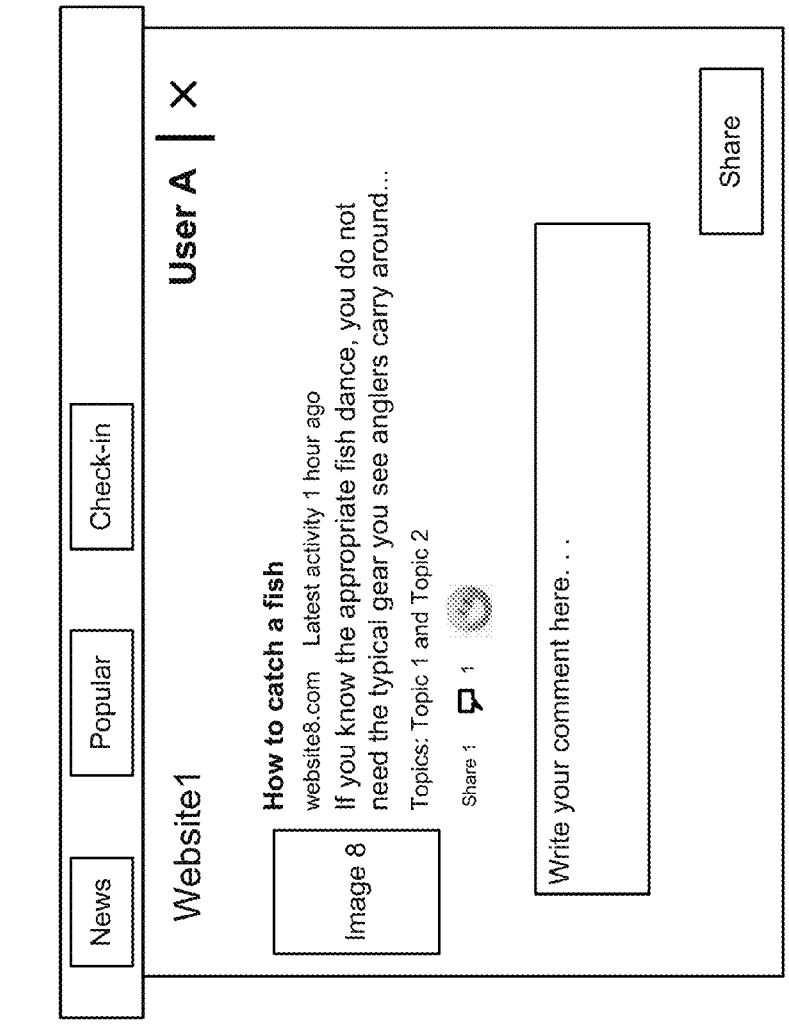
1200
News
Popular
Check-in
Website1
User A
X
Image 8
How to catch a fish
website8.com Latest activity 1 hour ago
If you know the appropriate fish dance, you do not need the typical gear you see anglers carry around...
Topics: Topic 1 and Topic 2
Share 1
1
Write your comment here. . .
Share

Figure 12A

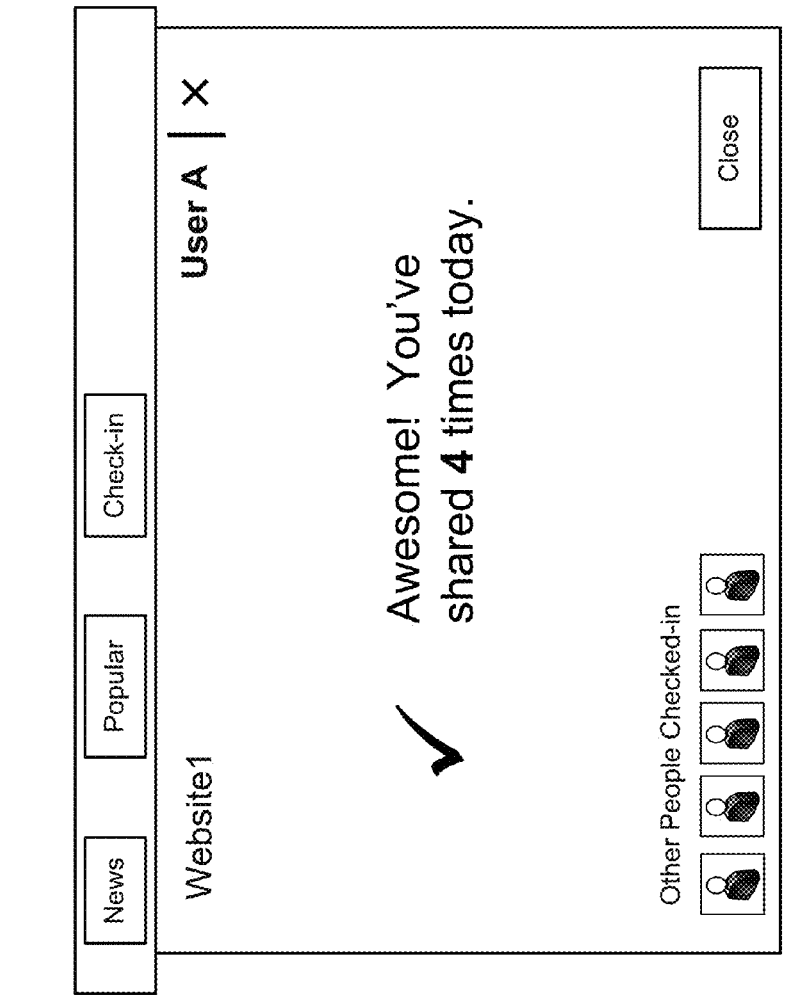
1210
News
Popular
Check-in
Website1
User A
X
Awesome! You've shared 4 times today.
Other People Checked-in
Close

Figure 12B

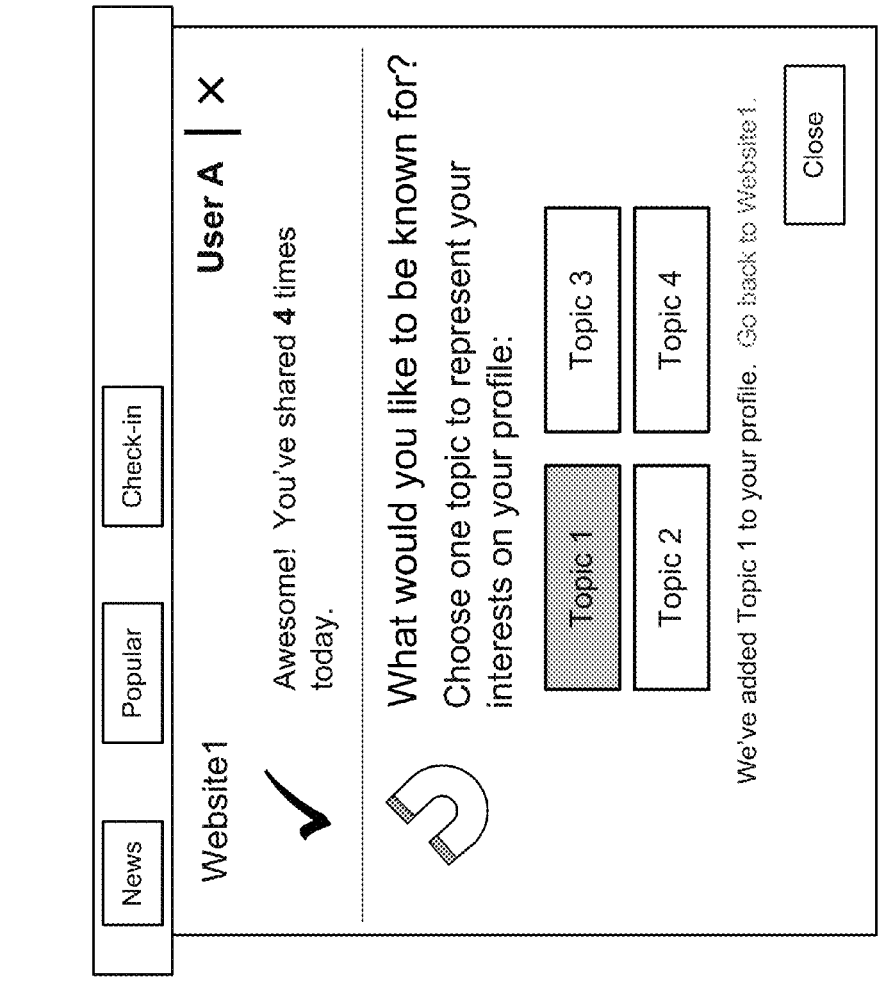
1220
News
Popular
Check-in
Website1
User A
Awesome! You've shared 4 times today.
What would you like to be known for?
Choose one topic to represent your interests on your profile:
Topic 1
Topic 2
Topic 3
Topic 4
We've added Topic 1 to your profile. Go back to Website1.
Close

Figure 12C

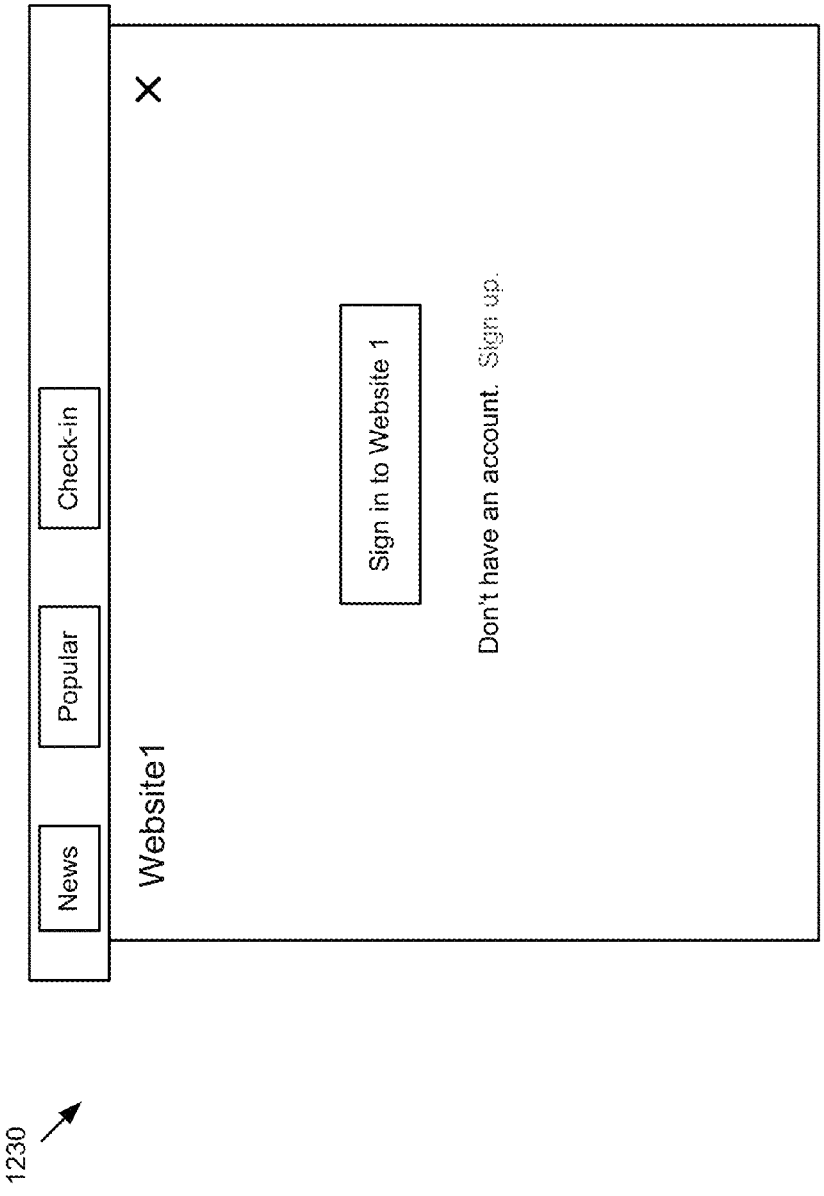
1230
News
Popular
Check-in
Website1
Sign in to Website 1
Don't have an account. Sign up.

Figure 12D

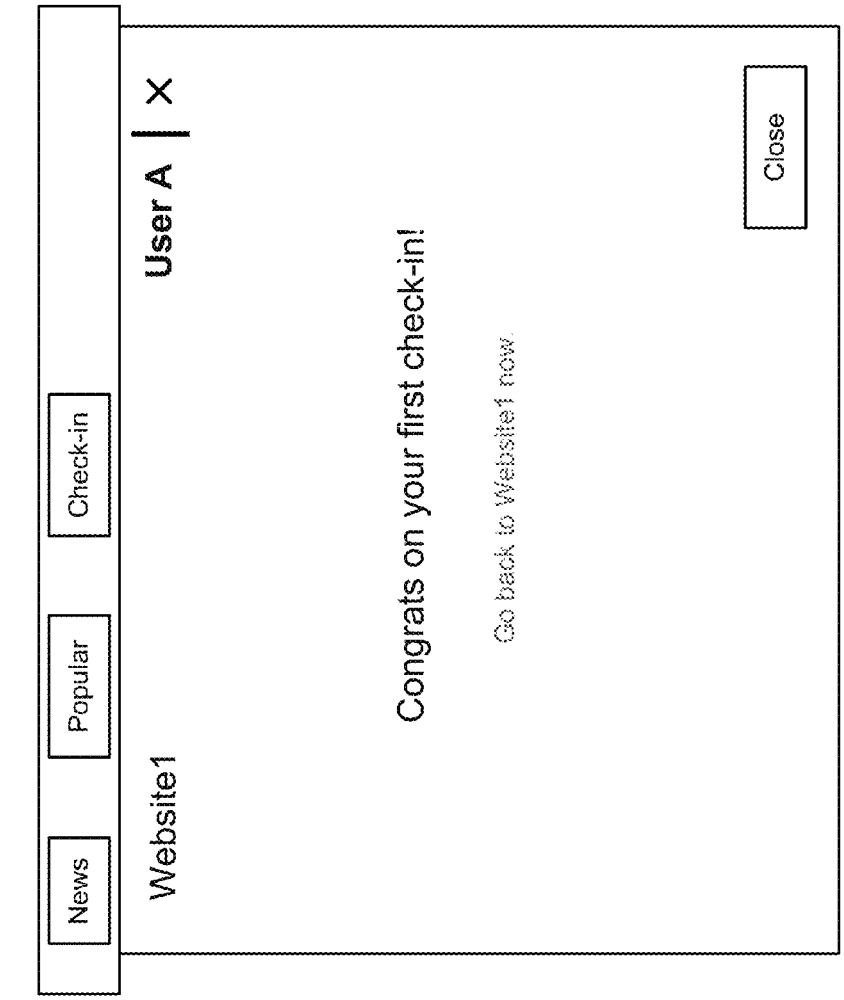
1240
News
Popular
Check-in
Website1
User A
X
Congrats on your first check-in!
Go back to Website1 now
Close

Figure 12E

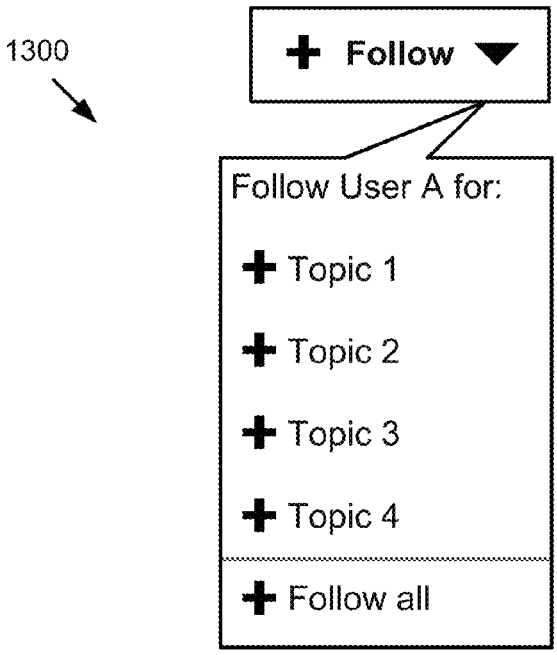

Figure 13A

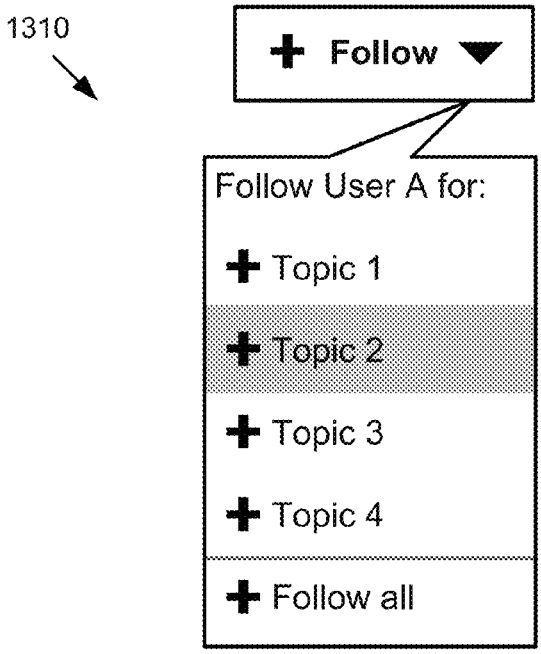

Figure 13B

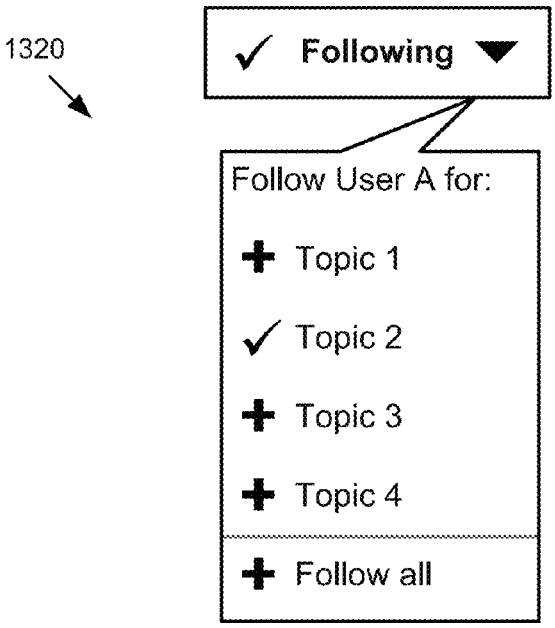

Figure 13C

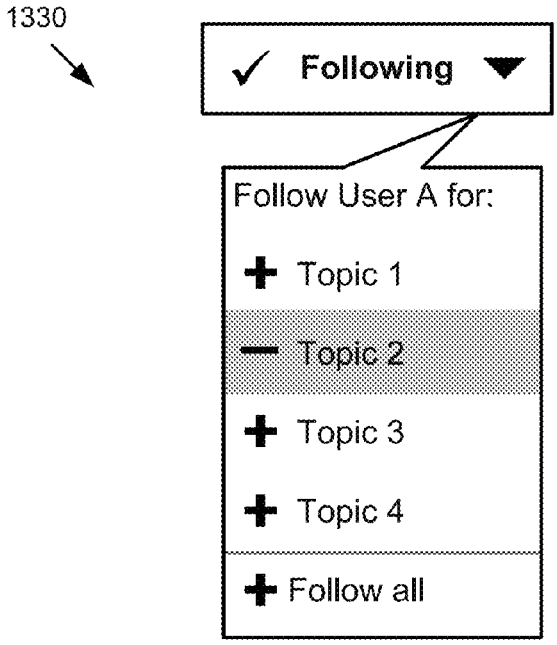

Figure 13D

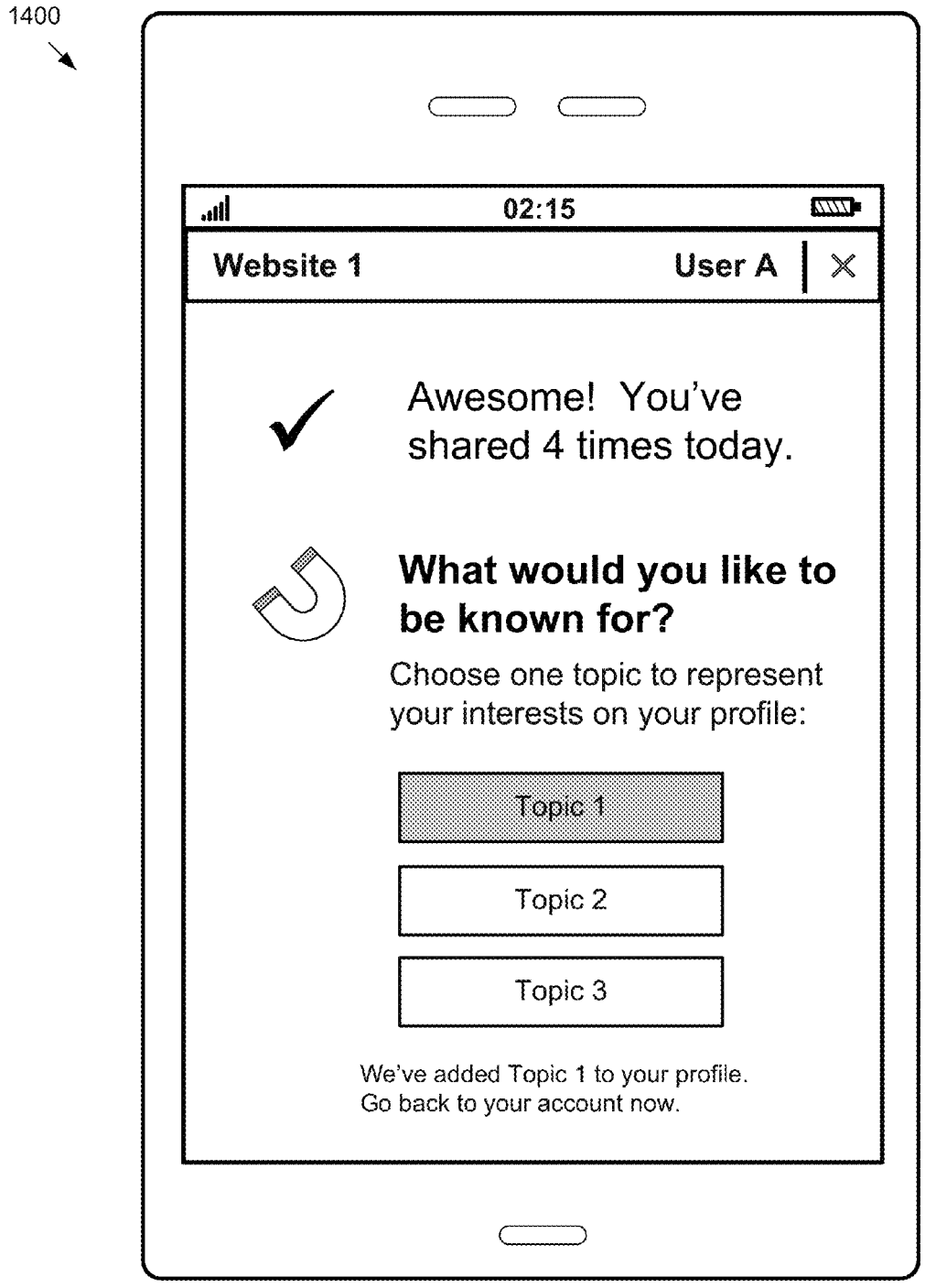
1400
02:15
Website 1
User A
Awesome! You've shared 4 times today.
What would you like to be known for?
Choose one topic to represent your interests on your profile:
Topic 1
Topic 2
Topic 3
We've added Topic 1 to your profile.
Go back to your account now.

Figure 14

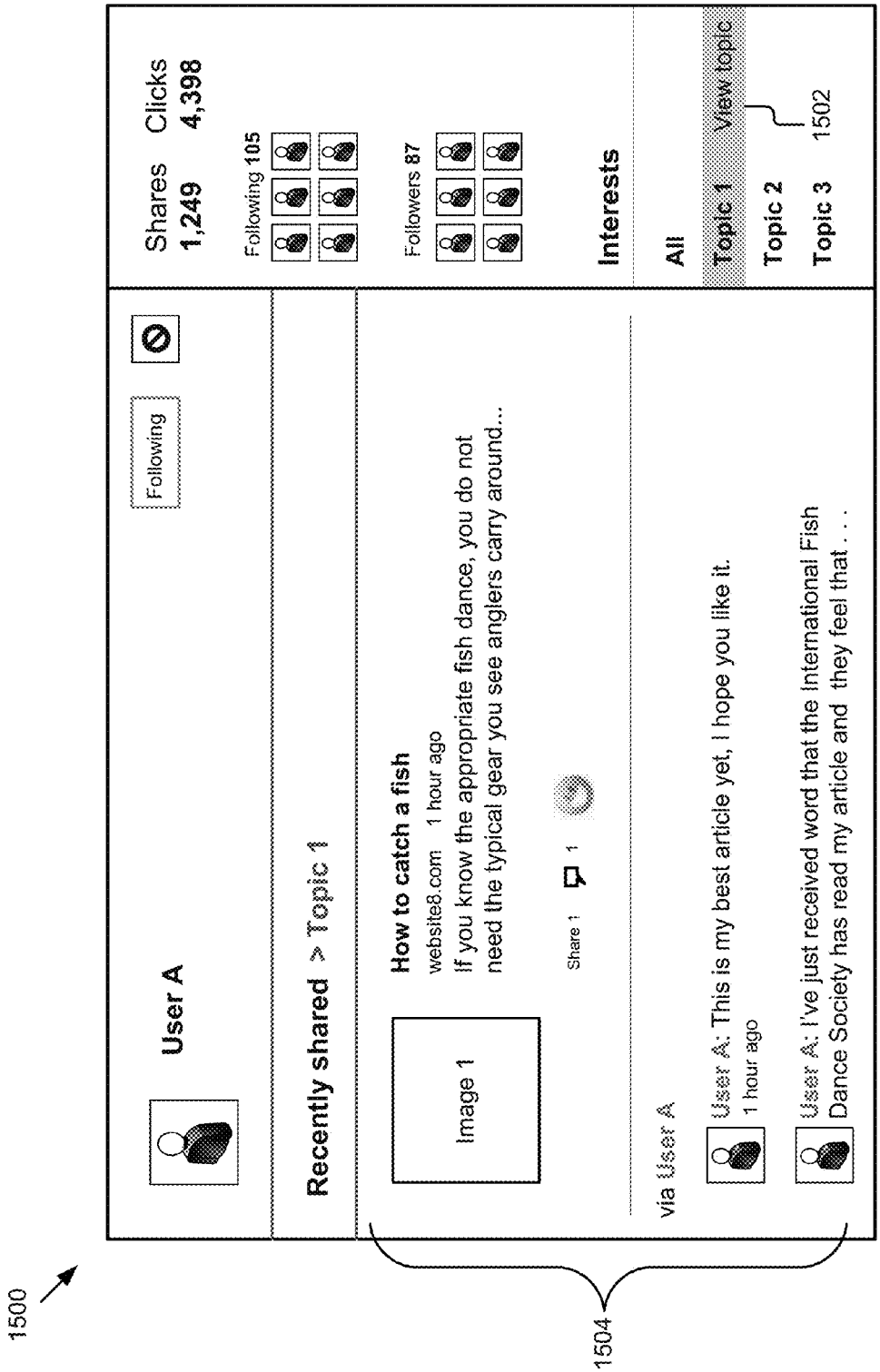
1500
User A
Following
Shares 1,249
Clicks 4,398
Following 105
Followers 87
Recently shared > Topic 1
Interests
All
Topic 1
View topic
Topic 2
Topic 3
1502
How to catch a fish
website8.com 1 hour ago
If you know the appropriate fish dance, you do not need the typical gear you see anglers carry around...
Image 1
Share 1
1
via User A
User A: This is my best article yet, I hope you like it.
1 hour ago
User A: I've just received word that the International Fish Dance Society has read my article and they feel that . . .
1504

Figure 15

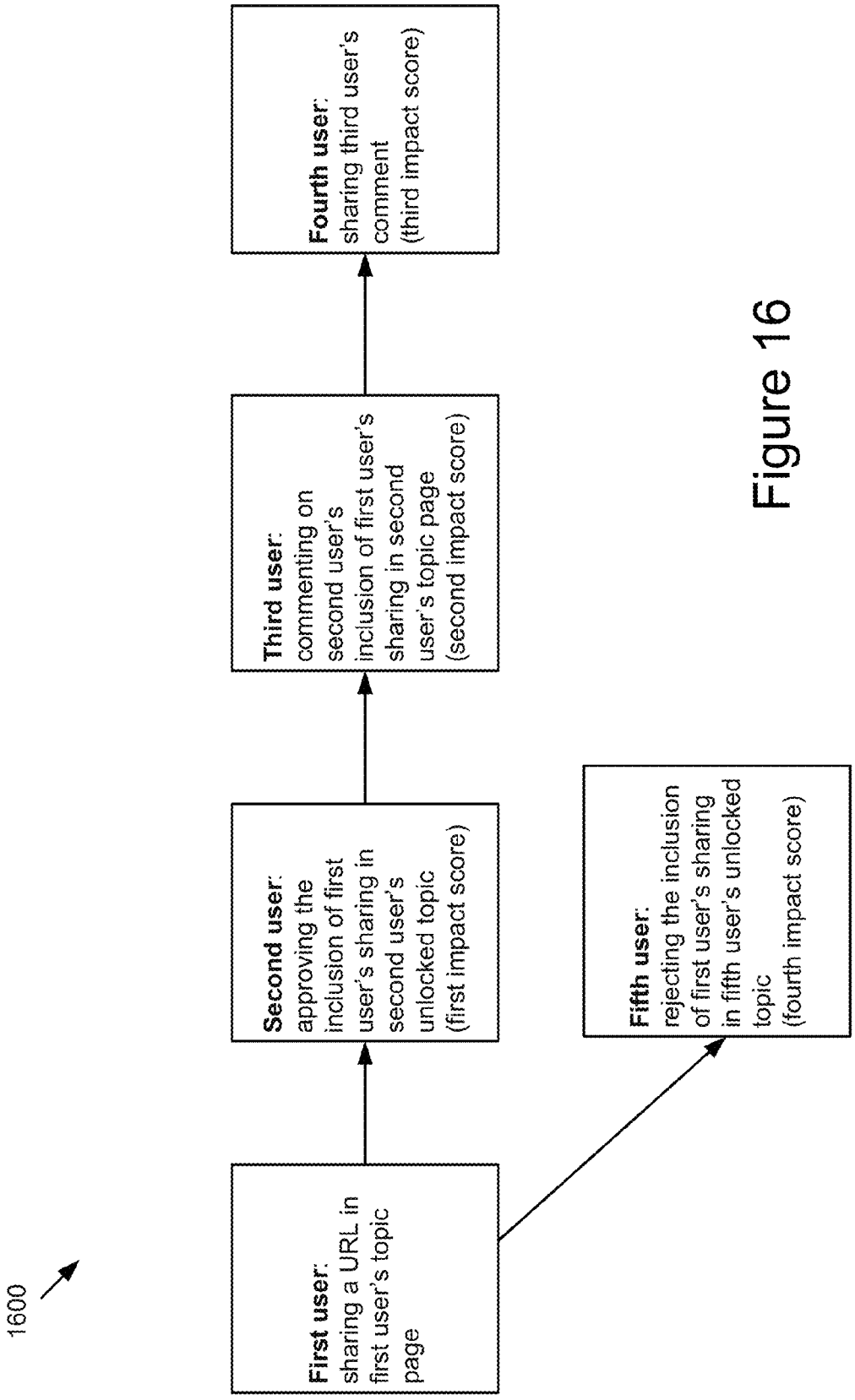
1600
First user: sharing a URL in first user's topic page
Second user: approving the inclusion of first user's sharing in second user's unlocked topic (first impact score)
Third user: commenting on second user's inclusion of first user's sharing in second user's topic page (second impact score)
Fourth user: sharing third user's comment (third impact score)
Fifth user: rejecting the inclusion of first user's sharing in fifth user's unlocked topic (fourth impact score)

Figure 16

CONTENT DISCOVERY IN A TOPICAL COMMUNITY

BACKGROUND

The specification relates to providing content to users.

Over the last decade, online networking has become increasingly popular. People frequently share content (e.g., videos, posts, comments, photos, movie reviews, book reviews, etc.) with other users in a social network. For example, a first user can connect to a second user in a social network and receive content shared by the second user in the social network via a social feed. However, in some instances the first user may merely want to receive the second users' shared content associated with a specific topic and may not want to receive other content irrelevant to the topic. Furthermore, a user may want to know who can be a reputable contributor for a topic that provides valuable content related to the topic and then subscribe to the reputable contributor's shared content under the topic.

SUMMARY

According to one innovative aspect of the subject matter described in this disclosure, a system for discovering content in a topical community includes: a processor; and a memory storing instructions that, when executed, cause the system to: receive data indicating an engagement action associated with a content item, the engagement action performed by a first user; determine a topical reputation score related to the topic for the first user based on one or more other engagement actions that are associated with the content item; receive data describing a second action performed by a second user on the content item, where the second user has abilities to curate content items associated with a topic for the content item; determine a first set of impact scores for the second action performed by the second user; and adjust the first topical reputation score for the first user based on the impact score.

In general, another innovative aspect of the subject matter described in this disclosure may be embodied in methods that include: receiving data indicating a first engagement action associated with a content item, the first engagement action performed by a first user; determining a topic associated with the content item; determining a topical reputation score related to the topic for the first user based on one or more second engagement actions performed by one or more second users with the content item; determining that the topical reputation score satisfies a reputation threshold; unlocking the topic for the first user responsive to the determination that the topical reputation score satisfies the reputation threshold; and providing the first user with an ability to curate other content items associated with the unlocked topic.

Another innovative aspect of the subject matter described in this disclosure may be embodied in methods that include: receiving data indicating en engagement action associated with a content item, the engagement action performed by a first user; determining a topical reputation score related to the topic for the first user based on one or more other engagement actions associated with the content item; receiving data describing a second action performed by a second user on the content item, where the second user has abilities to curate content items associated with a topic for the content item; determining a first set of impact scores for the second action performed by the second user; and adjusting the first topical reputation score for the first user based on the impact score.

Other implementations of one or more of these aspects include corresponding systems, apparatus, and computer programs, configured to perform the actions of the methods, encoded on computer storage devices.

These and other implementations may each optionally include one or more of the following features. For instance, the features include: the first engagement action including the first user publishing a uniform resource locator associated with the content item; the one or more second engagement actions including an indication of whether the one or more second users approve of the content item; the ability to curate including giving the first user the ability to control how one or more second content items appear in a feed associated with a topic; the one or more second content items being provided by one or more third users that are different than the first user; the second action being a management action and the first set of impact scores including a first impact score generated by the management action and a second impact score generated by a new engagement action established upon the management action; adjusting the first topical reputation score comprising adjusting the first topical reputation score based on a weighted sum of the first impact score and the second impact score; the second action being a management action that includes an acknowledgement of relevance between the content item and the topic; the first set of impact scores including a time-evolving modeling of one or more impact scores that affect the first topical reputation score; and the engagement action including sharing a uniform resource locator associated with a content item.

The present disclosure may be particularly advantageous in a number of respects. First, the system enables a first user to subscribe to content shared by a second user on a topical basis. Second, the system grants administrative rights related to a topic to a user based on content meritocracy. For example, the system provides administrative rights of a topic to a reputable contributor who provides valuable content to the topic. The system unlocks the topic for the reputable contributor so that the reputable contributor can manage the unlocked topic and other users can subscribe to the reputable contributor's unlocked topic. Third, the system determines a topical reputation score associated with a topic for a user based on one or more of: (1) the content shared by the user under the topic; (2) relevance of the shared content and the topic; and (3) other users' engagement actions and/or management actions. A set of impact scores can be generated and used to adjust the topical reputation score. Fourth, the system determines an interest profile associated with a user and provides an interest-based stream to the user. The system refines a topic structure included in the interest profile based on the user's engagement actions on the interest-based stream.

BRIEF DESCRIPTION OF THE DRAWINGS

The disclosure is illustrated by way of example, and not by way of limitation in the figures of the accompanying drawings in which like reference numerals are used to refer to similar elements.

FIG. **1** is a block diagram illustrating an example system for discovering content in a topical community.

FIG. **2**A is a block diagram illustrating an example of a reputation module.

FIG. **2**B is a block diagram illustrating an example of an interest module.

FIG. **3** is a flowchart of an example method for providing an interest-based stream to a user.

FIGS. **4**A-**4**C are flowcharts of another example method for providing an interest-based stream to a user.

FIG. **5**A is a graphic representation of an example user interface for providing a topic page to a user.

FIGS. **5**B and **5**C are graphic representations of example user interfaces for establishing an interest profile for a user.

FIGS. **5**D-**5**F are graphic representations of example user interfaces for sharing a content item.

FIG. **5**G is a graphic representation of an example user interface for recommending a topic to a user.

FIGS. **6**A-**6**D are flowcharts of an example method for managing a topical community.

FIG. **7** is a graphic representation of an example user interface for providing a topic recommendation to a user.

FIGS. **8**A-**8**E are graphic representations of example user interfaces for editing a topic for a content item.

FIG. **9** is a graphic representation of another example user interface for editing a topic for a content item.

FIG. **10** is a graphic representation of an example user interface for adding a content source to a topic.

FIG. **11** is a graphic representation of yet another example user interface for editing a topic for a content item.

FIGS. **12**A-**12**E are graphic representations of example user interfaces for unlocking a topic for a user.

FIGS. **13**A-**13**D are graphic representations of example user interfaces for engaging in a topic.

FIG. **14** is a graphic representation of another example user interface for unlocking a topic for a user.

FIG. **15** is a graphic representation of an example user interface for providing content associated with an unlocked topic to a user.

FIG. **16** is a graphic representation illustrating example management actions and example engagement actions associated with the management actions.

DETAILED DESCRIPTION

FIG. **1** illustrates a block diagram of some implementations of a system **100** for discovering content in a topical community. The illustrated system **100** includes user devices **115***a* . . . **115***n* that can be accessed by users **125***a* . . . **125***n*, a social network server **101**, a second server **107** and a topic server **113**. In FIG. **1** and the remaining figures, a letter after a reference number, e.g., "**115***a*," represents a reference to the element having that particular reference number. A reference number in the text without a following letter, e.g., "115," represents a general reference to instances of the element bearing that reference number. In the illustrated implementation, these entities of the system **100** are communicatively coupled via a network **105**.

The user devices **115***a*, **115***n* in FIG. **1** are used by way of example. While FIG. **1** illustrates two user devices **115***a* and **115***n*, the present disclosure applies to a system architecture having one or more user devices **115**. Furthermore, although FIG. **1** illustrates one network **105** coupled to the user devices **115**, the social network server **101**, the second server **107** and the topic server **113**, in practice one or more networks **105** can be connected to these entities.

In some instances, the interest module **103** and/or the reputation module **123** may be operable on the social network server **101**, which is coupled to the network **105** via signal line **104**. The social network server **101** can be a hardware server that includes a processor, a memory and network communication capabilities. In some implementations, the social network server **101** sends and receives data to and from one or more of the user devices **115***a*, **115***n*, the topic server **113** and the second server **107** via the network **105**. The social network server **101** includes a social network module **109**. A social network can be a type of social structure where the users may be connected by a common feature. The common feature includes relationships/connections, e.g., friendship, family, work, an interest, etc. The common features may be provided by one or more social networking systems including explicitly defined relationships and relationships implied by social connections with other online users, where the relationships form a social graph. In some examples, the social graph can reflect a mapping of these users and how they can be related. Furthermore, the social network server **101** and the social network module **109** may be representative of one social network and that there may be multiple social networks coupled to the network **105**, each having its own server, module and social graph. For example, a first social network may be more directed to business networking, a second may be more directed to or centered on academics, a third may be more directed to local business, a fourth may be directed to dating and others may be of general interest or a specific focus.

In some instances, the interest module **103** and/or the reputation module **123** may be stored on a second server **107**, which is connected to the network **105** via signal line **106**. In some implementations, the second server **107** can be a hardware server that includes a processor, a memory and network communication capabilities. The second server **107** sends and receives data to and from other entities of the system **100** via the network **105**. While FIG. **1** includes one second server **107**, the system **100** may include one or more third-party servers **107**.

In some instances, the interest module **103** and/or the reputation module **123** may be stored on a topic server **113**, which is connected to the network **105** via signal line **102**. In some implementations, the topic server **113** can be a hardware server that includes a processor, a memory and network communication capabilities. The topic server **113** sends and receives data to and from other entities of the system **100** via the network **105**. While FIG. **1** includes one topic server **113**, the system **100** may include one or more topic servers **113**.

In some instances, the interest module **103** and/or the reputation module **123** may be stored on a user device **115***a*, which is connected to the network **105** via signal line **108**. In some implementations, the user device **115***a*, **115***n* may be a computing device that includes a memory and a processor, for example a laptop computer, a desktop computer, a tablet computer, a mobile telephone, a personal digital assistant (PDA), a mobile email device, a portable game player, a portable music player, a reader device, a television with one or more processors embedded therein or coupled thereto or other electronic device capable of accessing a network **105**. In the illustrated implementation, the user **125***a* interacts with the user device **115***a*. The user device **115***n* is communicatively coupled to the network **105** via signal line **110**. The user **125***n* interacts with the user device **115***n*. In some instances, each of the interest module **103** and the reputation module **123** acts in part as a thin-client application that may be stored on the user devices **115***a*, **115***n* and in part as components that may be stored on one or more of the social network server **101**, the topic server **113** and the second server **107**.

In some implementations, the interest module **103** and the reputation module **123** can be stored in the same server or device. In some other implementations, the interest module **103** and the reputation module **123** may be stored in different servers or devices.

The interest module **103** can be code and routines for providing an interest-based stream to a user. In some instances, the interest module **103** can be implemented using hardware including a field-programmable gate array (FPGA) or an application-specific integrated circuit (ASIC). In some other instances, the interest module **103** can be implemented using a combination of hardware and software. In some instances, the interest module **103** may be stored in a combination of the devices and servers, or in one of the devices or servers. The interest module **103** is described below in more detail with reference to FIGS. **2**B-**4**C.

The reputation module **123** can be code and routines for managing a topical community. In some instances, the reputation module **123** can be implemented using hardware including a field-programmable gate array (FPGA) or an application-specific integrated circuit (ASIC). In some other instances, the reputation module **123** can be implemented using a combination of hardware and software. In some instances, the reputation module **123** may be stored in a combination of the devices and servers, or in one of the devices or servers. The reputation module **123** is described below in more detail with reference to FIGS. **2**A and **6**A-**6**D.

A topical community can be a community established based on various topics. In some implementations, a topical community establishes a network of connections via topics and users in the topical community share content on a topical basis. In some implementations, a topical community can be established based on a social graph and form a social network focusing on sharing content on a topical basis.

The network **105** can be a conventional type, wired or wireless, and may have numerous different configurations including a star configuration, token ring configuration or other configurations. Furthermore, the network **105** may include a local area network (LAN), a wide area network (WAN) (e.g., the Internet), and/or other interconnected data paths across which multiple devices may communicate. In some instances, the network **105** may be a peer-to-peer network. The network **105** may also be coupled to or includes portions of a telecommunications network for sending data in a variety of different communication protocols. In some instances, the network **105** includes Bluetooth communication networks or a cellular communications network for sending and receiving data including via short messaging service (SMS), multimedia messaging service (MMS), hypertext transfer protocol (HTTP), direct data connection, WAP, email, etc. In some implementations, the modules **103**, **109**, **123** can be stored in different servers or devices, and some of the functionality of the modules **103**, **109**, **123** can be provided by other modules **103**, **109**, **123**.

Referring now to FIG. **2**A, an example of the reputation module **123** is shown in more detail. FIG. **2**A is a block diagram of a computing device **200** that includes a reputation module **123**, a processor **202**, a memory **204**, a communication unit **206** and a storage device **243** according to some examples. Optionally, the computing device **200** includes an interest module **103** which is communicatively coupled to the bus **220** via signal line **249**. The components of the computing device **200** are communicatively coupled by a bus **220**. In some instances, the computing device **200** can be one of a social network server **101**, a user device **115**, a topic server **113** and a second server **107**.

The processor **202** includes an arithmetic logic unit, a microprocessor, a general purpose controller or some other processor array to perform computations and provide electronic display signals to a display device. The processor **202** is coupled to the bus **220** for communication with the other components via signal line **222**. Processor **202** processes data signals and may include various computing architectures including a complex instruction set computer (CISC) architecture, a reduced instruction set computer (RISC) architecture, or an architecture implementing a combination of instruction sets. Although FIG. **2**A includes a single processor **202**, multiple processors **202** may be included. Other processors, operating systems, sensors, displays and physical configurations are possible.

The memory **204** stores instructions and/or data that may be executed by the processor **202**. The memory **204** is coupled to the bus **220** for communication with the other components via signal line **224**. The instructions and/or data may include code for performing the techniques described herein. The memory **204** may be a dynamic random access memory (DRAM) device, a static random access memory (SRAM) device, flash memory or some other memory device. In some instances, the memory **204** also includes a non-volatile memory or similar permanent storage device and media including a hard disk drive, a floppy disk drive, a CD-ROM device, a DVD-ROM device, a DVD-RAM device, a DVD-RW device, a flash memory device, or some other mass storage device for storing information on a more permanent basis.

The communication unit **206** transmits and receives data to and from at least one of the user device **115**, the second server **107**, the topic server **113** and the social network server **101** depending upon where the reputation module **123** may be stored. The communication unit **206** is coupled to the bus **220** via signal line **226**. In some instances, the communication unit **206** includes a port for direct physical connection to the network **105** or to another communication channel. For example, the communication unit **206** includes a USB, SD, CAT-5 or similar port for wired communication with the user device **115**. In some instances, the communication unit **206** includes a wireless transceiver for exchanging data with the user device **115** or other communication channels using one or more wireless communication methods, including IEEE 802.11, IEEE 802.16, BLUETOOTH® or another suitable wireless communication method.

In some instances, the communication unit **206** includes a cellular communications transceiver for sending and receiving data over a cellular communications network including via short messaging service (SMS), multimedia messaging service (MMS), hypertext transfer protocol (HTTP), direct data connection, WAP, e-mail or another suitable type of electronic communication. In some instances, the communication unit **206** includes a wired port and a wireless transceiver. The communication unit **206** also provides other conventional connections to the network **105** for distribution of files and/or media objects using standard network protocols including TCP/IP, HTTP, HTTPS and SMTP, etc.

The storage device **243** can be a non-transitory memory that stores data for providing the functionality described herein. The storage device **243** may be a dynamic random access memory (DRAM) device, a static random access memory (SRAM) device, flash memory or some other memory devices. In some instances, the storage device **243** also includes a non-volatile memory or similar permanent storage device and media including a hard disk drive, a floppy disk drive, a CD-ROM device, a DVD-ROM device,

a DVD-RAM device, a DVD-RW device, a flash memory device, or some other mass storage device for storing information on a more permanent basis. In the illustrated implementation, the storage device **243** is communicatively coupled to the bus **220** via signal line **228**.

In some instances, the storage device **243** stores one or more of a count of a user's engagement actions in a specific time period (e.g., a day, a week, etc.), a topical reputation score per topic per user, one or more management actions performed by a user that has an unlocked topic, one or more unlocked topics for a user, a set of impact scores used to adjust a topical reputation score, a reputation threshold, identification data describing one or more other users that engage in a user's unlocked topic (e.g., a user's followers), one or more content sources for an unlocked topic, a whitelist of topics, an interest profile for a user and an interest-based stream for a user, etc. The data stored in the storage device **243** is further described below. In some instances, the storage device **243** may store other data for providing the functionality described herein.

In the illustrated implementation shown in FIG. **2**A, the reputation module **123** includes a first controller **203**, an entity module **205**, a classification module **207**, a reputation score module **209**, an unlocking module **211**, a filtering module **213**, a management module **215**, a presentation module **217** and a first user interface module **219**. These components of the reputation module **123** are communicatively coupled to each other via the bus **220**. The entity module **205** and the classification module **207** are depicted using dashed lines to indicate that in some implementations these modules can be stored in the interest module **103** as illustrated in FIG. **2**B.

The first controller **203** can be software including routines for handling communications between the reputation module **123** and other components of the computing device **200**. In some instances, the first controller **203** can be a set of instructions executable by the processor **202** to provide the functionality described below for handling communications between the reputation module **123** and other components of the computing device **200**. In some instances, the first controller **203** can be stored in the memory **204** of the computing device **200** and can be accessible and executable by the processor **202**. The first controller **203** may be adapted for cooperation and communication with the processor **202** and other components of the computing device **200** via signal line **230**.

The first controller **203** sends and receives data, via the communication unit **206**, to and from one or more of a user device **115**, a topic server **113**, a social network server **101** and a second server **107**. For example, the first controller **203** receives, via the communication unit **206**, data describing an engagement action performed by a user from a user device **115** and sends the data to the entity module **205**. In another example, the first controller **203** receives graphical data for providing a user interface to a user from the first user interface module **219** and sends the graphical data to a user device **115**, causing the user device **115** to present the user interface to the user.

In some instances, the first controller **203** receives data from other components of the reputation module **123** and stores the data in the storage device **243**. For example, the first controller **203** receives data describing a topical reputation score from the reputation score module **209** and stores the data in the storage device **243**. In some instances, the first controller **203** retrieves data from the storage device **243** and sends the data to other components of the reputation module **123**. For example, the first controller **203** retrieves data describing one or more followers of a user from the storage device **243** and sends the data to the presentation module **217** for presenting content items related to a topic to the one or more followers.

The entity module **205** can be software including routines for determining one or more topics in a content item. In some instances, the entity module **205** can be a set of instructions executable by the processor **202** to provide the functionality described below for determining one or more topics in a content item. In some instances, the entity module **205** can be stored in the memory **204** of the computing device **200** and can be accessible and executable by the processor **202**. The entity module **205** may be adapted for cooperation and communication with the processor **202** and other components of the computing device **200** via signal line **232**.

Example content items include, but are not limited to, a uniform resource locator (URL), a video, a picture, an audio file, an article, a book, a product, a video game, a post in a social network, an acknowledgement, a comment, etc. Example topics in a content item include, but are not limited to, a topic describing book reading, one or more granular topics describing novel reading and science fiction reading, a topic describing video games and a granular topic describing a specific video game, etc.

In some implementations, a user provides one or more topics for a content item to the entity module **205**, causing the entity module **205** to label the content item using the one or more topics. For example, a user identifies one or more topics for a content item when performing an engagement action on the content item and associates the engagement action with the one or more identified topics.

In some implementations, the entity module **205** receives data describing an engagement action associated with a content item performed by a user in a social network. The entity module **205** obtains content included in the content item and identifies one or more topics describing the content. For example, the entity module **205** receives data describing that a user has shared a URL in a social network, and identifies one or more key terms describing subjects included in the content item. Examples of an engagement action include, but are not limited to, commenting on a content item, acknowledging a content item, sharing or resharing a content item, selecting an emoting icon associated with a content item and marking a content item as a favorite item, etc. An emoting icon can be an icon that a user uses to express sentiment reactions to a content item. For example, an emoting icon can be "smile," "frown," "cry" and "laugh," etc. In some implementations, the entity module **205** includes a headless browser to obtain content included in the content item and identifies one or more topics describing the content.

In some implementations, the entity module **205** stores the content item and the one or more identified topics in the storage **243**. In some other implementations, the entity module **205** sends the content item and the one or more identified topics to one or more of the classification module **207** and the reputation score module **209**.

The classification module **207** can be software including routines for classifying a content item into one or more categories. In some instances, the classification module **207** can be a set of instructions executable by the processor **202** to provide the functionality described below for classifying a content item into one or more categories. In some instances, the classification module **207** can be stored in the memory **204** of the computing device **200** and can be accessible and executable by the processor **202**. The clas-

sification module **207** may be adapted for cooperation and communication with the processor **202** and other components of the computing device **200** via signal line **234**.

The classification module **207** receives one or more identified topics associated with a content item from the entity module **205**. In some implementations, the classification module **207** categorizes the content item into one or more categories each related to an identified topic. For example, the classification module **207** creates an association between the content item and a category related to an identified topic, and stores the association in the storage **243**. In some other implementations, the classification module **207** classifies the content item to one or more categories each related to a whitelist topic using the one or more identified topics. For example, if an identified topic describes a recently released novel, the classification module **207** categorizes the content item to a whitelist topic that describes a collection of modern novels based on the identified topic. In yet some other implementations, the classification module **207** updates the whitelist topics by adding the one or more identified topics as additional whitelist topics and classifies the content item to one or more categories each related to one of the additional whitelist topics.

A whitelist topic can be an approved topic. For example, a whitelist topic may be a topic approved by an administrator of the computing device **200**. In another example, a whitelist topic can be an unlocked topic. An unlocked topic for a user can be a topic published in the user's public profile. For example, an unlocked topic can be a topic customized for the user that other users can engage in (e.g., a topic that other users can follow). In some implementations, an unlocked topic for a user can be a topic that the user has administrative rights to manage. For example, a user can approve or reject an inclusion of other users' sharings in his or her unlocked topic. In some implementations, a user having an unlocked topic can be considered as a reputable contributor to the unlocked topic and has administrative rights to perform management actions on the unlocked topic while other users cannot perform management actions on the unlocked topic. The management of an unlocked topic is described below in more detail.

The reputation score module **209** can be software including routines for determining a topical reputation score related to a topic for a user. In some instances, the reputation score module **209** can be a set of instructions executable by the processor **202** to provide the functionality described below for determining a topical reputation score related to a topic for a user. In some instances, the reputation score module **209** can be stored in the memory **204** of the computing device **200** and can be accessible and executable by the processor **202**. The reputation score module **209** may be adapted for cooperation and communication with the processor **202** and other components of the computing device **200** via signal line **236**.

A topical reputation score can be data indicating a reputation of a topic with content provided by a user. For example, for the same topic provided by a first user and a second user, if a first topical reputation score associated with the first user can be greater than a second topical reputation score associated with the second user, content provided by the first user may have better quality than that provided by the second user.

In some implementations, the reputation score module **209** receives a topic related to a content item from the entity module **205**. The content item has a first engagement action performed by a first user. The reputation score module **209** determines other users' engagement actions associated with the first engagement action and generates a topical reputation score related to the topic for the first user based on the other users' engagement actions. For example, assume a first user shares a URL in a social network. The reputation score module **209** receives a topic related to the URL shared by the first user from the entity module **205**. One or more second users in the social network perform one or more engagement actions on the first user's sharing of the URL. Examples of the second users' engagement actions include, but are not limited to, resharing the URL, clicking on the URL, commenting on the URL, replying to the first user's sharing, reposting the first user's sharing, acknowledging the first user's sharing, marking the first user's sharing as a favorite or clicking an emoting icon on the first user's sharing, etc. The reputation score module **209** determines a count of the second users' engagement actions, and generates a topical reputation score for the topic related to the first user's sharing based on the count of the second users' engagement actions.

In some implementations, the reputation score module **209** receives, from the management module **215**, data describing a management action performed by a second user on the first user's engagement action. For example, the second user can approve and add the first user's sharing of a URL to the second user's unlocked topic. In another example, the second user can reject the first user's sharing of the URL in the second user's unlocked topic. The second user's unlocked topic may be identified as similar to or the same as the topic associated with the first user's engagement action. A management action can be an operation for managing an unlocked topic. For example, a management action performed by the second user can be one of approving the first user's engagement action in the second user's unlocked topic, adding the first user's engagement action to the unlocked topic, recommending the first user's engagement action to other users in a topic page of the unlocked topic, advertising the first user's engagement action in the topic page of the unlocked topic, rejecting to include the first user's engagement action in the unlocked topic or removing the first user's engagement action from the unlocked topic, etc. A topic page can be a page where content included in a topic can be published.

The second user's management action may have a positive or negative impact on the first user's engagement action. This positive or negative impact may be described by an impact score. For example, a positive impact on the first user's engagement action can be described by a positive impact score; a negative impact on the first user's engagement action can be described by a negative impact score. For example, an approval management action to include the first user's engagement action in the second user's unlocked topic generates a positive impact score for the first user's engagement action; a rejection management action to reject the first user's engagement action in the second user's unlocked topic generates a negative impact score for the first user's engagement action.

In some implementations, the reputation score module **209** determines a set of impact scores for the first user's engagement action based on the second user's management action. The set of impacts scores forms a chain of impact scores indicating a chain of impacts on the first user's engagement action. For example, if the second user's management action describes that the second user approves the inclusion of the first user's sharing of a URL in the second user's unlocked topic, the reputation score module **209** generates a first impact score caused by the second user's management action. If a third user has commented on the

second user's management action (e.g., the third user has commented on the second user's approval of the first user's sharing in the second user's topic page), the reputation score module **209** generates a second impact score caused by the third user's comment on the second user's topic page. If a fourth user has shared the third user's comment, the reputation score module **209** generates a third impact score caused by the fourth user's sharing of the comment. The first impact score, the second impact score and the third impact score form a chain of impact scores for the first user's engagement action. An example illustrating a chain of impact scores is illustrated with reference to FIG. **16**.

In some implementations, the set of impact scores includes a time-evolving modeling of the impact scores. For example, the set of impact scores includes a first impact score associated with the second user's management action and a second impact score associated with a third user's engagement action established upon the second user's management action. The set of impact scores including the first and second impact scores can be changed over time, because more and more other users can engage in the second user's management action (e.g., the second user's approval or rejection of the first user's sharing) and the third user's engagement action in future. In some implementations, the set of impact scores includes a time-evolving modeling of the chain of impact scores.

An impact score may promote or demote a topical reputation score of a topic. For example, a positive impact score associated with an approval management action to include the first user's engagement action in an unlocked topic can promote the topical reputation score, and a negative impact score associated with a rejection management action to reject the first user's engagement action in an unlocked topic can demote the topical reputation score. In some implementations, the reputation score module **209** adjusts the topical reputation score related to the topic based on the set of impact scores. For example, the reputation score module **209** adjusts the topical reputation score based on a weighted sum of the set of impact scores. In some implementations, a first user shares a content item. The reputation module **123** determines a topic for the content item and determines a corresponding increase in the first user's topical reputation score. A second user takes an engagement action to share the same content item that was shared by the first user. The second user gets a weighted increase in their topical reputation score. For example, the second user gets less of an increase in their topical reputation score relative to the first user because the second user simply re-shared a content item that was initially shared by the first user. In this way the reputation module **123** encourages users to take engagement actions that involve providing new content items to the reputation module **123**. In some implementations, the weighted score assigned to the second user is based in part on a time-evolving modeling of the chain of impact scores as described above in the previous paragraph.

In some implementations, the first user has various engagement actions related to the same topic (e.g., various sharings of the same topic). The reputation score module **209** updates the topical reputation score for the topic based on each of the first user's engagement action. For example, the reputation score module **209** updates the topical reputation score for the topic each time the first user shares a content item related to the topic. The reputation score module **209** also adjusts the topical reputation score based on each set of impact scores related to each sharing of content items.

In some implementations, the reputation score module **209** stores data describing the topical reputation score in the storage **243**. In some implementations, the reputation score module **209** sends data describing the topical reputation score to the unlocking module **211**.

The unlocking module **211** can be software including routines for unlocking a topic for a user. In some instances, the unlocking module **211** can be a set of instructions executable by the processor **202** to provide the functionality described below for unlocking a topic for a user. In some instances, the unlocking module **211** can be stored in the memory **204** of the computing device **200** and can be accessible and executable by the processor **202**. The unlocking module **211** may be adapted for cooperation and communication with the processor **202** and other components of the computing device **200** via signal line **238**.

In some implementations, the unlocking module **211** receives data describing a topical reputation score related to a topic of a user's engagement action (e.g., a user's sharing of a URL). The unlocking module **211** determines whether the topical reputation score satisfies a reputation threshold. For example, the unlocking module **211** determines whether a topical reputation score is equal to or greater than a reputation threshold. The reputation threshold can be configured by an administrator of the computing device **200** or determined by the unlocking module **211** using heuristic techniques. If the topical reputation score is equal to or greater than the reputation threshold, the unlocking module **211** unlocks the topic for the user. In some implementations, the unlocking of a topic allows the user to curate content items associated with the unlocked topic. For example, the user can publish the topic in his or her public profile, provides administrative rights to the user for managing content included in the unlocked topic and allows other users to engage in the user's unlocked topic. For example, if another user may be interested in the user's unlocked topic, the other user can merely follow the user's unlocked topic and receive a feed including content associated with the unlocked topic rather than receiving all the content published by the user. In some implementations, providing a user the ability to curate content items for a topic includes giving the user the ability to control how content items appear in the feed and where the content items are ranked in the feed. In some implementations, the content items that are curated by a first user are submitted by one or more second users. In some implementations, the curating content items includes the reputation module **123** providing the user with a content items and the user providing an input to the reputation module **123** that indicates whether the content item should be associated with a topic. In some implementations, the reputation module **123** generates a graphical user interface (e.g., a widget) that the user uses to curate the content items.

In some implementations, the user can select to publish the unlocked topic in the public profile or not. If the user selects to publish the unlocked topic, the unlocking module **211** adds the unlocked topic in the user's public profile. For example, the unlocking module **211** adds the unlocked topic as a badge or an achievement in the user's topic page. Otherwise, the unlocking module **211** adds the unlocked topic to the user's private profile and does not publish the unlocked topic in the user's public profile.

In some implementations, the unlocking module **211** stores data describing the unlocked topic in the storage **243**. In some implementations, the unlocking module **211** sends

data describing the unlocked topic to one or more of the filtering module **213**, the management module **215** and the presentation module **217**.

The filtering module **213** can be software including routines for filtering content based on an unlocked topic. In some instances, the filtering module **213** can be a set of instructions executable by the processor **202** to provide the functionality described below for filtering content based on an unlocked topic. In some instances, the filtering module **213** can be stored in the memory **204** of the computing device **200** and can be accessible and executable by the processor **202**. The filtering module **213** may be adapted for cooperation and communication with the processor **202** and other components of the computing device **200** via signal line **240**.

In some implementations, the filtering module **213** receives data describing that a second user has engaged in a first user's unlocked topic. For example, the second user has followed or favorited the first user's unlocked topic. The filtering module **213** retrieves data describing a set of content items published by the first user from the storage **243** and filters the set of content items using the first user's unlocked topic. For example, the filtering module **213** generates a filtered result that includes one or more content items related to the unlocked topic from the set of content items. The filtering module **213** sends the filtered result to the presentation module **217**, causing the presentation module **217** to present the filtered result to the second user. In some implementations, the filtering module **213** stores the filtered result in the storage **243**.

The management module **215** can be software including routines for managing an unlocked topic. In some instances, the management module **215** can be a set of instructions executable by the processor **202** to provide the functionality described below for managing an unlocked topic. In some instances, the management module **215** can be stored in the memory **204** of the computing device **200** and can be accessible and executable by the processor **202**. The management module **215** may be adapted for cooperation and communication with the processor **202** and other components of the computing device **200** via signal line **242**.

In some implementations, the management module **215** receives data describing an unlocked topic for a first user from the unlocking module **211**. The management module **215** grants administrative rights to the first user, allowing the first user to perform one or more management actions on the unlocked topic. For example, the management module **215** instructs the first user interface module **219** to generate graphical data for providing a user interface to the first user, allowing the first user to manage content items included in the unlocked topic via the user interface. In another example, the first user manages subscription of the unlocked topic from other users that have engaged in the unlocked topic (e.g., followers of the unlocked topic) via the user interface.

In some instances, the first user approves or rejects the inclusion of an engagement action from a second user (e.g., the second user's sharing of a content item) in the first user's unlocked topic. The first user's management action on the second user's engagement action describes an acknowledgement of relevance between the second user's engagement action and the unlocked topic. For example, if the second user's engagement action can be relevant to the unlocked topic, the first user may include the second user's engagement action in the unlocked topic; if the second user's engagement action can be irrelevant to the unlocked topic, the first user may reject to include the second user's engagement action in the unlocked topic. The first user's management action has an impact on a topical reputation score related to the second user's engagement action as described above.

In some instances, the first user adds a content source or additional content items in the unlocked topic. The management module **215** instructs the first user interface module **219** to generate graphical data for providing a user interface to the first user, allowing the first user to add a content source or additional content items to the unlocked topic via the user interface. A content source can be a source that provides content to a topic. For example, a content source can be a RSS feed or a social network account that provides content items to an unlocked topic.

In some implementations, the management module **215** sends management data describing the first user's management action related to the second user's engagement action to one or more of the reputation score module **209** and the presentation module **217**. In some other implementations, the management module **215** stores the management data in the storage **243**.

The presentation module **217** can be software including routines for presenting data to users. In some instances, the presentation module **217** can be a set of instructions executable by the processor **202** to provide the functionality described below for presenting data to users. In some instances, the presentation module **217** can be stored in the memory **204** of the computing device **200** and can be accessible and executable by the processor **202**. The presentation module **217** may be adapted for cooperation and communication with the processor **202** and other components of the computing device **200** via signal line **244**.

In some implementations, the presentation module **217** presents a count of a user's engagement actions to the user. For example, the presentation module **217** presents a count of the user's sharings performed in a day, a week or a month to the user. In some implementations, the presentation module **217** receives an unlocked topic associated with a user form the unlocking module **211** and presents the unlocked topic to the user. In some implementations, the presentation module **217** receives a filtered result for a first user that engages in a second user's unlocked topic from the filtering module **213** and presents the filtered result to the first user. In some implementations, the presentation module **217** updates content items included in an unlocked topic based on one or more management actions associated with the unlocked topic and presents the updated content items to users that engage in the unlocked topic. In some other implementations, the presentation module **217** may present other data to users.

The first user interface module **219** can be software including routines for generating graphical data for providing user interfaces to users. In some instances, the first user interface module **219** can be a set of instructions executable by the processor **202** to provide the functionality described below for generating graphical data for providing user interfaces to users. In some instances, the first user interface module **219** can be stored in the memory **204** of the computing device **200** and can be accessible and executable by the processor **202**. The first user interface module **219** may be adapted for cooperation and communication with the processor **202** and other components of the computing device **200** via signal line **246**.

In some instances, the first user interface module **219** generates graphical data for providing a user interface that presents an option for a user to publish an unlocked topic. The first user interface module **219** sends the graphical data

to a user device **115** operated by the user, causing the user device **115** to present the option to the user via the user interface. In some instances, the first user interface module **219** generates graphical data for providing a user interface that allows a user to manage content items included in an unlocked topic. In some instances, the first user interface module **219** generates graphical data for providing a user interface that allows a user to add content sources or additional content items to an unlocked topic. Example user interfaces are shown in FIGS. **7-15**. The first user interface module **219** may generate graphical data for providing other user interfaces to users.

An example use of the reputation module **123** can be illustrated below. Assume a user Robert shares various content items associated with a topic "start-up" in one or more social networks. The entity module **205** determines one or more topics (including the start-up topic) associated with the content items. The classification module **207** classifies the content items into one or more categories each related to a determined topic. The one or more categories include a category related to the start-up topic. For each content item shared in each social network, the reputation score module **209** determines a set of engagement actions performed by a first set of other users. The reputation score module **209** generates a topical reputation score related to the start-up topic for Robert based on each set of engagement actions related to each sharing of a content item. The reputation score module **209** adjusts the topical reputation score based on a set of management actions performed by a second set of other users. The second set of other users manages at least one of Robert's sharings in their unlocked topic. The unlocked topic of the second set of other users can be identified as similar to or the same as the start-up topic.

The unlocking module **211** determines whether the topical reputation score associated with the topic is equal to or greater than a reputation threshold. If the topical reputation score is equal to or greater than the reputation threshold, the unlocking module **211** unlocks the topic for Robert and provides administrative rights to Robert for managing the unlocked topic. Upon the publication of the unlocked topic in Robert's public profile, other users can follow the start-up topic from Robert and receive content items shared by Robert under the unlocked topic. Robert can manage the content items included in his unlocked topic and his management actions can generate an impact on other users' engagement actions. For example, if an article labeled as "start-up" and shared by Alice may be irrelevant to the start-up topic, Robert rejects to include in his unlocked topic the shared item from Alice. Robert's rejection management action has a negative impact on a topical reputation score related to Alice's start-up topic. In another example, if a video labeled as "start-up" and shared by Bob may be relevant to the start-up topic, Robert approves to include in his unlocked topic the shared item from Bob. Robert's approval management action has a positive impact on a topical reputation score related to Bob's start-up topic. In some implementations, Robert can also perform various management actions on his unlocked topic, e.g., adding a content source, adding content items to the unlocked topic, editing topics included in his public profile or topic page, etc.

Referring now to FIG. **2**B, an example of the interest module **103** is shown in more detail. FIG. **2**B is a block diagram of a computing device **250** that includes an interest module **103**, a processor **252**, a memory **254**, a communication unit **256** and a storage device **293** according to some examples. Optionally, the computing device **250** includes a reputation module **123**. The components of the computing device **250** are communicatively coupled by a bus **270**. In some instances, the computing device **250** can be one of a social network server **101**, a user device **115**, a topic server **113** and a second server **107**.

The reputation module **123** is communicatively coupled to the bus **270** via signal line **299**. The processor **252** is communicatively coupled to the bus **270** via signal line **272**. The memory **254** is communicatively coupled to the bus **270** via signal line **274**. The communication unit **256** is communicatively coupled to the bus **270** via signal line **276**. The storage **293** is communicatively coupled to the bus **270** via signal line **278**. The processor **252**, the memory **254**, the communication unit **256** and the storage device **293** have similar structure and provide similar functionality as the processor **202**, the memory **204**, the communication unit **206** and the storage **243** respectively. The description will not be repeated here.

In the illustrated implementation, the interest module **103** includes a second controller **253**, a profile module **259**, a stream module **261** and a second user interface module **263**. Optionally, the interest module **103** includes an entity module **205** and a classification module **207**. The entity module **205** and the classification module **207** are described above with reference to FIG. **2**A, and the description will not be repeated here. The entity module **205** is communicatively coupled to the bus **270** via signal line **282**. The classification module **207** is communicatively coupled to the bus **270** via signal line **284**.

The second controller **253** can be software including routines for handling communications between the interest module **103** and other components of the computing device **250**. In some instances, the second controller **253** can be a set of instructions executable by the processor **252** to provide the functionality described below for handling communications between the interest module **103** and other components of the computing device **250**. In some instances, the second controller **253** can be stored in the memory **254** of the computing device **250** and can be accessible and executable by the processor **252**. The second controller **253** may be adapted for cooperation and communication with the processor **252** and other components of the computing device **250** via signal line **280**.

The second controller **253** sends and receives data, via the communication unit **256**, to and from one or more of a user device **115**, a topic server **113**, a social network server **101** and a second server **107**. For example, the second controller **253** receives, via the communication unit **256**, data describing an engagement action performed by a user from a user device **115** and sends the data to the entity module **205**. In another example, the second controller **253** receives graphical data for providing a user interface to a user from the second user interface module **263** and sends the graphical data to a user device **115**, causing the user device **115** to present the user interface to the user.

In some instances, the second controller **253** receives data from components of the interest module **103** and stores the data in the storage device **293**. In some instances, the second controller **253** retrieves data from the storage device **293** and sends the data to components of the interest module **103**. In some instances, the second controller **253** may handle communication between components of the interest module **103**.

The profile module **259** can be software including routines for managing an interest profile associated with a user. In some instances, the profile module **259** can be a set of instructions executable by the processor **252** to provide the functionality described below for managing an interest pro-

file associated with a user. In some instances, the profile module **259** can be stored in the memory **254** of the computing device **250** and can be accessible and executable by the processor **252**. The profile module **259** may be adapted for cooperation and communication with the processor **252** and other components of the computing device **250** via signal line **286**.

An interest profile associated with a user can be data describing one or more interests of the user. For example, an interest profile can be data describing one or more topics that a user marks as favorite topics. In some implementations, a user provides an input including one or more interests, hobbies and favorite topics, etc., to the profile module **259**. The profile module **259** generates an interest profile for the user based on the user input.

In some implementations, the profile module **259** determines one or more engagement actions performed by a user, where the one or more engagement actions relate to a topic. The profile module **259** determines an interest score associated with the topic for the user based on the one or more engagement actions. An interest score associated with a topic can be data indicating a user's interest on the topic. The profile module **259** determines whether the interest score associated with the topic is equal to or greater than a score threshold. The score threshold can be configured by an administrator of the computing device **250** or determined by the profile module **259** using heuristic techniques.

If the interest score related to the topic is equal to or greater than the score threshold, the profile module **259** recommends the topic to the user. For example, the profile module **259** invites the user to follow the topic or mark the topic as a favorite topic if the user has not yet followed or favorited the topic. If the user engages in the topic recommendation, the profile module **259** updates the user's interest profile based on the user's engagement action. For example, if the user marks the topic as a favorite topic or follows the topic, the profile module **259** adds the topic to the user's interest profile.

In some implementations, the profile module **259** refines a topic structure included in the interest profile over time based on engagement actions performed by the user. A topic structure can be data describing a set of topics that may be interested to a user. For example, a topic structure can be a topic hierarchy that includes one or more high-level topics, one or more first granular topics originated from each high-level topic and one or more second granular topics originated from each first granular topic, etc. The topic structure can include various high-level topics and various granular topics. For example, assume a user marks music as a favorite topic when the user initially joins a social network. The profile module **259** generates an interest profile having a topic structure that includes a first topic "music" for the user. The stream module **261** generates and presents an interest-based stream to the user that includes a first post related to rock music and a second post related to pop music. The user marks the first post related to rock music as a favorite post. The profile module **259** refines the topic structure in the interest profile based on the user's engagement action so that rock music can be included as a granular topic under the music topic in the topic structure. In this example, the topic structure includes a first tier topic "music" and a second tier topic "rock music." The second tier topic can be more refined than the first tier topic. In other examples, the topic structure has various tiers of topics in addition to the first tier topic and the second tier topic, for example, a third tier topic of rock music from a specific band and a fourth tier topic of rock music from a key member in the specific band, etc.

In some implementations, the profile module **259** stores data describing the interest profile in the storage **293**. In some implementations, the profile module **259** sends data describing the interest profile to the stream module **261**.

The stream module **261** can be software including routines for providing an interest-based stream to a user. In some instances, the stream module **261** can be a set of instructions executable by the processor **252** to provide the functionality described below for providing an interest-based stream to a user. In some instances, the stream module **261** can be stored in the memory **254** of the computing device **250** and can be accessible and executable by the processor **252**. The stream module **261** may be adapted for cooperation and communication with the processor **252** and other components of the computing device **250** via signal line **290**.

In some implementations, the stream module **261** receives data describing an interest profile associated with a user from the profile module **259**. The stream module **261** generates an interest-based stream for the user based on the interest profile. For example, if the interest profile includes a topic describing a band specialized in rock music, the stream module **261** generates an interest-based stream for the user that includes content items related to the band. The stream module **261** sends the interest-based stream to the second user interface module **263**, causing the second user interface module **263** to generate graphical data for providing the interest-based stream to the user in a user interface.

The second user interface module **263** can be software including routines for generating graphical data for providing user interfaces to users. In some instances, the second user interface module **263** can be a set of instructions executable by the processor **252** to provide the functionality described below for generating graphical data for providing user interfaces to users. In some instances, the second user interface module **263** can be stored in the memory **254** of the computing device **250** and can be accessible and executable by the processor **252**. The second user interface module **263** may be adapted for cooperation and communication with the processor **252** and other components of the computing device **250** via signal line **292**.

In some instances, the second user interface module **263** generates graphical data for providing a user interface that provides an interest-based stream to a user. The second user interface module **263** sends the graphical data to a user device **115** operated by the user, causing the user device **115** to present the interest-based stream to the user via the user interface. Example user interfaces are shown in FIGS. **5**A-**5**G. The second user interface module **263** may generate graphical data for providing other user interfaces to users.

FIG. **3** is a flowchart of an example method **300** for providing an interest-based stream to a user. In some instances, the second controller **253** receives **302** one or more content items from one or more content sources. The classification module **207** classifies **304** the one or more content items according to one or more whitelist topics. The profile module **259** determines **306** an interest profile associated with a user. The stream module **261** generates **308** an interest-based stream for the user based on the interest profile. The stream module **261** provides **310** the interest-based stream to the user. The second controller **253** receives **312** data describing an engagement action related to the interest-based stream. The profile module **259** updates **314** the interest profile associated with the user based on the

engagement action. The stream module **261** updates **316** the interest-based stream for the user based on the updated interest profile.

FIGS. **4**A-**4**C are flowcharts of another example method **400** for providing an interest-based stream to a user. Referring to FIG. **4**A, the second controller **253** receives **402** a first content item from a content source. The entity module **205** determines **404** a topic based on the first content item. Optionally, the classification module **207** updates **406** a whitelist of topics based on the determined topic. The classification module **207** classifies **408** the first content item to a category related to a whitelist topic. The classification module **207** stores **410** an association between the first content item and the category in the storage **293**. The profile module **259** determines **412** an interest profile associated with a user. The stream module **261** generates **414** an interest-based stream for the user using the interest profile. The stream module **261** provides **416** the interest-based stream to the user on a topic page of the user.

Referring to FIG. **4**B, the second controller **253** receives **418** data describing a first engagement action performed by the user on a second content item presented in the interest-based stream. The entity module **205** determines **420** a whitelist topic associated with the second content item. The profile module **259** determines **422** an interest score related to the whitelist topic for the user based on the first engagement action. The profile module **259** determines **424** whether the interest score is less than a score threshold. If the interest score is less than the score threshold, the method **400** moves to block **434** depicted in FIG. **4**C. Otherwise, the method **400** moves to block **426**. At block **426**, the method **400** determines whether the user engages in the whitelist topic associated with the first engagement action. For example, the method **400** determines whether the user already follows the whitelist topic or marks the whitelist topic as a favorite topic. If the user already engages in the whitelist topic, the method **400** moves to block **434**. Otherwise, the profile module **259** recommends **428** the whitelist topic to the user. For example, the profile module **259** invites the user to follow the whitelist topic or marks the whitelist topic as a favorite topic.

Referring to FIG. **4**C, the second controller **253** receives **430** a second engagement action associated with the topic recommendation. For example, the second controller **253** receives an engagement action indicating that the user marks the whitelist topic as a favorite topic. The profile module **259** updates **432** the interest profile associated with the user based on the second engagement action. The profile module **259** refines **434** a topic structure in the interest profile using the second engagement action. The stream module **261** updates **436** the interest-based stream using the refined interest profile and presents the updated stream to the user.

FIG. **5**A is a graphic representation **500** of an example user interface for providing a topic page to a user. In the example user interface, a user can mark a topic as a favorite topic by clicking on a button **502** or reject a topic by clicking on a button **504**. If the user clicks on a menu **506**, the example user interface will show topics marked as favorites by the user. If the user clicks on a menu **508**, the example user interface will show topics rejected by the user.

FIGS. **5**B and **5**C are graphic representations **520**, **530** of example user interfaces for establishing an interest profile for a user. The example user interfaces allow a user to select one or more topics as favorite topics. The user can also select one of the emoting icons **532** for a content item or a topic as illustrated in FIG. **5**C. The profile module **259** generates an interest profile for the user based on the selected topics and/or the selection of the emoting icons **532**.

FIGS. **5**D-**5**F are graphic representations **540**, **550**, **560** of example user interfaces for sharing a content item. Referring to FIG. **5**D, a user can comment on a content item via a box **542**. If the user clicks on a button **544**, the example user interface shown in FIG. **5**E will be presented to the user, allowing the user to add one or more topics to the content item. FIG. **5**F illustrates one or more topics added by the user in a box **562**. The user can click on a share button **564** to share the content item including the one or more added topics with other users.

FIG. **5**G is a graphic representation **570** of an example user interface for recommending a topic to a user. The example user interface includes a message **572** that invites the user to mark a topic as a favorite topic.

FIGS. **6**A-**6**D are flowcharts of an example method **600** for establishing a topical community. Referring to FIG. **6**A, the first controller **203** receives **602** data describing a first user's engagement action associated with a content item. Optionally, the presentation module **217** presents **603** a count of the first user's engagement actions to the first user. In some implementations, the engagement actions of steps **602** and **603** include the engagement actions of a second user. The entity module **205** determines **604** a topic based on the content item. The classification module **207** categorizes **606** the content item based on the topic. The reputation score module **209** determines **607** other users' engagement actions associated with the first user's engagement action. The reputation score module **209** determines **608** a first topical reputation score related to the topic for the first user based on the other users' engagement actions.

In some implementations, the first controller **203** receives **610** data describing a management action performed by a second user on the first user's engagement action. For example, the management action describes that the second user approves or rejects to include in the first user's engagement action in the second user's unlocked topic. The reputation score module **209** determines **612** a first set of impact scores based on the second user's management action. The reputation score module **209** adjusts **614** the first topical reputation score based on the first set of impact scores.

Referring to FIG. **6**B, the unlocking module **211** determines **616** whether the first topical reputation score is less than a reputation threshold. If the first topical reputation score is less than the reputation threshold, the unlocking module **211** does not set **618** the topic as an unlocked topic. Otherwise, the unlocking module **211** sets **620** the topic as an unlocked topic. Optionally, the presentation module **217** presents **622** a count of the first user's engagement actions and the unlocked topic to the first user. The first user interface module **219** generates **623** graphical data for providing a user interface that presents an option for the first user to publish the unlocked topic. The first controller **203** receives **624** selection data from the first user via the user interface. The unlocking module **211** determines **626** whether the first user chooses to publish the unlocked topic based on the selection data. If the first user selects to publish the unlocked topic, the unlocking module **211** adds **628** the unlocked topic to the first user's public profile. Otherwise, the unlocking module **211** does not add **630** the unlocked topic to the first user's public profile.

Referring to FIG. **6**C, the first controller **203** receives **632** data indicating a third user engages in the first user's unlocked topic. The filtering module **213** filters **634** the first user's content items using the unlocked topic. The presentation module **217** presents **636** the filtered content items to

the third user. The first user interface module **219** generates **638** graphical data for providing a user interface that allows the first user to manage content items included in the unlocked topic. The first controller **203** sends **640** the graphical data to a user device **115** for presenting the user interface to the first user on the user device **115**. The first controller **203** receives **642** data describing a first user's management action via the user interface. The reputation score module **209** determines **644** a fourth user's engagement action related to the first user's management action. For example, the reputation score module **209** determines a fourth user's sharing of a content item that the first user approves or rejects to include in the first user's unlocked topic. The reputation score module **209** determines **645** a second set of impact scores for the fourth user's engagement action.

Referring to FIG. **6**D, the reputation score module **209** adjusts **646** a second topical reputation score for the fourth user's engagement action based on the first user's management action. In some implementations, the first user interface module **219** generates **648** graphical data for providing a user interface that allows the first user to add one or more content sources or additional content items to the unlocked topic. The first controller **203** sends **650** the graphical data to the user device **115** for presenting the user interface to the first user. The second controller **203** receives **652** data describing one or more content sources or additional content items added by the first user via the user interface. The presentation module **217** updates **654** the content items included in the unlocked topic based on the one or more content sources or additional content items. The presentation module **217** presents **656** the updated content items to the third user (e.g., a follower of the unlocked topic) based on the unlocked topic.

FIG. **7** is a graphic representation **700** of an example user interface for providing a topic recommendation to a user. The user can add a topic to a content item by selecting a favorite topic or providing a new topic as illustrated in a box **702**.

FIGS. **8**A-**8**E are graphic representations **800**, **810**, **820**, **830**, **840** of example user interfaces for editing a topic for a content item. If a user hovers over Image **1** illustrated in FIG. **8**A using a cursor, a description for Image **1** will expand over the image as shown in FIG. **8**B. In FIG. **8**C, the example user interface does not show Image **1** and displays full text for the description. If the user hovers over a button **832** illustrated in FIG. **8**D, an explanation for the button **832** can be shown in the user interface as a message **834**. If the user clicks on the button **832**, a topic "Topic **1**" can be added to the content item. FIG. **8**E illustrates a message describing that the editing for Topic **1** completes and suggesting the user to edit other topics.

FIG. **9** is a graphic representation **900** of another example user interface for editing a topic for a content item. A user can select a button **902** to confirm that the content item belongs to a suggested topic, select a button **904** to indicate that the content item does not belong to the suggested topic or select an emoting icon **906** if the user does not know whether the content item belongs to the suggested topic or not.

FIG. **10** is a graphic representation **1000** of an example user interface for adding a content source to a topic. A content source can be a RSS feed **1002** or a social network user account **1004**.

FIG. **11** is a graphic representation **1100** of yet another example user interface for editing a topic for a content item. For example, a user can select a topic **1102** for the content item by clicking on the topic **1102**.

FIGS. **12**A-**12**E are graphic representations **1200**, **1210**, **1220**, **1230**, **1240** of example user interfaces for unlocking a topic for a user. FIG. **12**A illustrates a content item shared by the user. FIG. **12**B presents a count of sharings that the user performed in a day. FIG. **12**C illustrates an example user interface allowing a user to add an unlocked topic in the public profile. After selecting a topic (e.g., Topic **1**), FIG. **12**D shows an example user interface that requests the user to sign in. FIG. **12**E shows an example user interface greeting the user after signing in.

FIGS. **13**A-**13**D are graphic representations **1300**, **1310**, **1320**, **1330** of example user interfaces for engaging in a topic. FIG. **13**A depicts one or more topics that a user can follow. The user can select a topic (e.g., Topic **2**) to follow as shown in FIG. **13**B. FIG. **13**C shows that Topic **2** has been selected by the user to follow. The user can also remove the selection of Topic **2** by clicking on Topic **2** again as shown in FIG. **13**D.

FIG. **14** is a graphic representation **1400** of another example user interface for unlocking a topic for a user. The user can select a topic (e.g., Topic **1**) to add to the public profile.

FIG. **15** is a graphic representation **1500** of an example user interface for providing content associated with an unlocked topic to a user. If a user selects a topic **1502**, the content included in the selected topic **1502** can be shown in Section **1504**.

FIG. **16** is a graphic representation **1600** illustrating example management actions and example engagement actions associated with the management actions. In the illustrated example, a first user shares a URL in the first user's topic page. The first user identifies the URL related to a first topic. A second user manages a first unlocked topic and approves the inclusion of the first user's sharing in the first unlocked topic. The first unlocked topic may be similar to or the same as the first topic. The reputation score module **209** determines a first impact score for the first user's sharing based on the second user's management action. A third user comments on the second user's inclusion of the first user's sharing in the second user's topic page. The reputation score module **209** determines a second impact score for the first user's sharing based on the third user's commenting. A fourth user shares the third user's comment on the fourth user's topic page. The reputation score module **209** determines a third impact score for the first user's sharing based on the fourth user's sharing of the comment. The first, second and third impact scores form a chain of impact scores for the first user's sharing.

A fifth user manages a second unlocked topic and rejects the inclusion of the first user's sharing in the second unlocked topic. The second unlocked topic can be the same as or similar to the first topic. The reputation score module **209** determines a fourth impact score for the first user's sharing based on the fifth user's management action. The reputation score module **209** adjusts a topical reputation score for the first topic based on the first impact score, the second impact score, the third impact score and the fourth impact score.

In the above description, for purposes of explanation, numerous specific details are set forth in order to provide a thorough understanding of the specification. It will be apparent, however, to one skilled in the art that the disclosure can be practiced without these specific details. In other instances, structures and devices are shown in block diagram form in order to avoid obscuring the description. For

example, the present implementation is described in one implementation below primarily with reference to user interfaces and particular hardware. However, the present implementation applies to any type of computing device that can receive data and commands, and any peripheral devices providing services.

Reference in the specification to "one implementation" or "an implementation" means that a particular feature, structure, or characteristic described in connection with the implementation is included in at least one implementation of the description. The appearances of the phrase "in one implementation" in various places in the specification are not necessarily all referring to the same implementation.

Some portions of the detailed descriptions that follow are presented in terms of algorithms and symbolic representations of operations on data bits within a computer memory. These algorithmic descriptions and representations are the means used by those skilled in the data processing arts to most effectively convey the substance of their work to others skilled in the art. An algorithm is here, and generally, conceived to be a self consistent sequence of steps leading to a desired result. The steps are those requiring physical manipulations of physical quantities. Usually, though not necessarily, these quantities take the form of electrical or magnetic signals capable of being stored, transferred, combined, compared, and otherwise manipulated. It has proven convenient at times, principally for reasons of common usage, to refer to these signals as bits, values, elements, symbols, characters, terms, numbers or the like.

It should be borne in mind, however, that all of these and similar terms are to be associated with the appropriate physical quantities and are merely convenient labels applied to these quantities. Unless specifically stated otherwise as apparent from the following discussion, it is appreciated that throughout the description, discussions utilizing terms including "processing" or "computing" or "calculating" or "determining" or "displaying" or the like, refer to the action and processes of a computer system, or similar electronic computing device, that manipulates and transforms data represented as physical (electronic) quantities within the computer system's registers and memories into other data similarly represented as physical quantities within the computer system memories or registers or other such information storage, transmission or display devices.

The present implementation of the specification also relates to an apparatus for performing the operations herein. This apparatus may be specially constructed for the required purposes, or it may comprise a general-purpose computer selectively activated or reconfigured by a computer program stored in the computer. Such a computer program may be stored in a computer readable storage medium, including, but is not limited to, any type of disk including floppy disks, optical disks, CD-ROMs, and magnetic disks, read-only memories (ROMs), random access memories (RAMs), EPROMs, EEPROMs, magnetic or optical cards, flash memories including USB keys with non-volatile memory or any type of media suitable for storing electronic instructions, each coupled to a computer system bus.

The specification can take the form of an entirely hardware implementation, an entirely software implementation or an implementation containing both hardware and software elements. In a preferred implementation, the specification is implemented in software, which includes but is not limited to firmware, resident software, microcode, etc.

Furthermore, the description can take the form of a computer program product accessible from a computer-usable or computer-readable medium providing program code for use by or in connection with a computer or any instruction execution system. For the purposes of this description, a computer-usable or computer readable medium can be any apparatus that can contain, store, communicate, propagate, or transport the program for use by or in connection with the instruction execution system, apparatus, or device.

A data processing system suitable for storing and/or executing program code will include at least one processor coupled directly or indirectly to memory elements through a system bus. The memory elements can include local memory employed during actual execution of the program code, bulk storage, and cache memories which provide temporary storage of at least some program code in order to reduce the number of times code must be retrieved from bulk storage during execution.

Input/output or I/O devices (including but not limited to keyboards, displays, pointing devices, etc.) can be coupled to the system either directly or through intervening I/O controllers.

Network adapters may also be coupled to the system to enable the data processing system to become coupled to other data processing systems or remote printers or storage devices through intervening private or public networks. Modems, cable modem and Ethernet cards are just a few of the currently available types of network adapters.

Finally, the algorithms and displays presented herein are not inherently related to any particular computer or other apparatus. Various general-purpose systems may be used with programs in accordance with the teachings herein, or it may prove convenient to construct more specialized apparatus to perform the required method steps. The required structure for a variety of these systems will appear from the description below. In addition, the specification is not described with reference to any particular programming language. It will be appreciated that a variety of programming languages may be used to implement the teachings of the specification as described herein.

The foregoing description of the implementations of the specification has been presented for the purposes of illustration and description. It is not intended to be exhaustive or to limit the specification to the precise form disclosed. Many modifications and variations are possible in light of the above teaching. It is intended that the scope of the disclosure be limited not by this detailed description, but rather by the claims of this patent application. As will be understood by those familiar with the art, the specification may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. Likewise, the particular naming and division of the modules, routines, features, attributes, methodologies and other aspects are not mandatory or significant, and the mechanisms that implement the specification or its features may have different names, divisions and/or formats. Furthermore, as will be apparent to one of ordinary skill in the relevant art, the modules, routines, features, attributes, methodologies and other aspects of the disclosure can be implemented as software, hardware, firmware or any combination of the three. Also, wherever a component, an example of which is a module, of the specification is implemented as software, the component can be implemented as a standalone program, as part of a larger program, as a plurality of separate programs, as a statically or dynamically linked library, as a kernel loadable module, as a device driver, and/or in every and any other way known now or in the future to those of ordinary skill in the art of computer programming. Additionally, the disclosure is in no way limited to implementation in any specific programming

language, or for any specific operating system or environment. Accordingly, the disclosure is intended to be illustrative, but not limiting, of the scope of the specification, which is set forth in the following claims.

What is claimed is:

1. A method comprising:

receiving data indicating a first engagement action associated with a content item, the first engagement action performed by a first user;

determining a topic associated with the content item;

determining a first topical reputation score related to the topic for the first user based on one or more second engagement actions performed by one or more second users associated with the content item;

determining that first the topical reputation score of the first user satisfies a reputation threshold;

unlocking the topic for the first user responsive to the determination that the first topical reputation score of the first user satisfies the reputation threshold; and

responsive to unlocking the topic for the first user,

providing the first user with an ability to curate another content item for the unlocked topic;

receiving, from the first user, a management action including one of an approval and a rejection to include the another content item in the unlocked topic; and

modifying a second topical reputation score related to the unlocked topic of another user based on the management action by the first user.

2. The method of claim **1**, wherein the first engagement action includes the first user publishing a uniform resource locator associated with the content item.

3. The method of claim **1**, wherein the one or more second engagement actions include an indication of whether the one or more second users approve of the content item.

4. The method of claim **1**, further comprising:

responsive to unlocking the topic for the first user, providing the first user with an ability to control how one or more second content items appear in a feed associated with the unlocked topic.

5. The method of claim **4**, wherein the one or more second content items are provided by one or more third users that are different than the first user.

6. A method comprising:

receiving data indicating an engagement action associated with a content item, the engagement action performed by a first user and the content item associated with a topic;

determining a first topical reputation score related to the topic for the first user based on one or more other engagement actions associated with the content item;

receiving data describing a second management action performed by a second user on the content item, where the second user has abilities to curate content items associated with the topic, the second management action including one of an approval and a rejection to include the content item in the topic;

determining a first set of impact scores for the second management action performed by the second user; and

adjusting the first topical reputation score for the first user based on the first set of impact scores.

7. The method of claim **6**, wherein the first set of impact scores includes a first impact score generated by the second management action and a second impact score generated by a new engagement action established upon the second management action.

8. The method of claim **7**, wherein adjusting the first topical reputation score comprises adjusting the first topical reputation score based on a weighted sum of the first impact score and the second impact score.

9. The method of claim **6**, wherein the second management action includes an acknowledgement of relevance between the content item and the topic.

10. The method of claim **6**, wherein the first set of impact scores includes a time-evolving modeling of one or more impact scores that affect the first topical reputation score.

11. The method of claim **6**, wherein the engagement action includes sharing a uniform resource locator associated with the content item.

12. A system comprising:

a processor; and

a memory storing instructions that, when executed, cause the system to:

receive data indicating an engagement action associated with a content item, the engagement action performed by a first user and the content item associated with a topic;

determine a first topical reputation score related to the topic for the first user based on one or more other engagement actions associated with the content item;

receive data describing a second management action performed by a second user on the content item, where the second user has abilities to curate content items associated with the topic, the second management action including one of an approval and a rejection to include the content item in the topic;

determine a first set of impact scores for the second management action performed by the second user; and

adjust the first topical reputation score for the first user based on the first set of impact scores.

13. The system of claim **12**, wherein the first set of impact scores includes a first impact score generated by the second management action and a second impact score generated by a new engagement action established upon the second management action.

14. The system of claim **13**, wherein adjusting the first topical reputation score comprises adjusting the first topical reputation score based on a weighted sum of the first impact score and the second impact score.

15. The system of claim **12**, wherein the second management action includes an acknowledgement of relevance between the content item and the topic.

16. The system of claim **12**, wherein the first set of impact scores includes a time-evolving modeling of one or more impact scores that affect the first topical reputation score.

17. The system of claim **12**, wherein the engagement action includes sharing a uniform resource locator associated with the content item.

18. A computer program product comprising a non-transitory computer usable storage medium including a computer readable program, wherein the computer readable program when executed on a computer causes the computer to:

receive data indicating an engagement action associated with a content item, the engagement action performed by a first user and the content item associated with a topic;

determine a first topical reputation score related to the topic for the first user based on one or more other engagement actions associated with the content item;

receive data describing a second management action performed by a second user on the content item, where the second user has abilities to curate content items

associated with the topic, the second management action including one of an approval and a rejection to include the content item in the topic;

determine a first set of impact scores for the second management action performed by the second user; and

adjust the first topical reputation score for the first user based on the first set of impact scores.

19. The computer program product of claim **18**, wherein the first set of impact scores includes a first impact score generated by the second management action and a second impact score generated by a new engagement action established upon the second management action.

20. The computer program product of claim **19**, wherein the first set of impact scores includes a time-evolving modeling of one or more impact scores that affect the first topical reputation score and adjusting the first topical reputation score comprises adjusting the first topical reputation score based on a weighted sum of the first impact score and the second impact score.

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UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 9,436,709 B1
APPLICATION NO. : 13/743263
DATED : September 6, 2016
INVENTOR(S) : Mario Ventura Anima et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On the Title Page:

In the Abstract, at the third line of (57), please replace "when executed" with --that, when executed,--

In the Specification:

In column 1, line 14, please replace "users'" with --user's--

In column 1, line 59, please replace "en" with --an--

In column 10, line 9, please replace "users'" with --user's--

In column 10, line 16, please replace "users'" with --user's--

In column 10, line 18, please replace "users'" with --user's--

In column 23, line 52, please replace "but is not" with --but not--

Signed and Sealed this
First Day of November, 2016

Michelle K. Lee

Michelle K. Lee
Director of the United States Patent and Trademark Office